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in cooperation with
Faculty of Finance - D. A. Tsenov Academy of Economics
Faculty of Management University of Warsaw
Faculty of Law, Economics and Social Sciences Sale - Mohammed V University in Rabat
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Economic and Social Development

87th International Scientific Conference on Economic and Social Development –
"Economics, Management, Finance and Banking"

Book of Proceedings

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CONTENTS

FORMATION OF THE CORPORATE CULTURE

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ABSTRACT

Corporate culture is a complex and multifaceted phenomenon. It is formed under the influence of the people working in the organization, while at the same time determining their behavior and interactions. The main purpose of this article is to establish the main stages that the company goes through in the formation of its corporate culture. The attention is focused on the role of the manager and the main tools that contribute to the implementation of the desired corporate culture. The main expected results are identified stages in the process of forming the corporate culture. The main research methods used in the study are content analysis, method of comparison, intuitive and systematic approach, method of analysis and synthesis.
Keywords: *Corporate culture, Moral authority, Stages of formation, Strategy, Values*

1. INTRODUCTION

The importance and role of corporate culture has long been recognized by theory and practice. The interest in the cultural peculiarities of the organization appeared in the late 1970s and the reason for this is the assessment of the role of the human factor in the activities of the organization. The topic of corporate culture was actively discussed in the 1960s and 1970s and continues to be particularly relevant today. This is due to the fact that the knowledge of the characteristic features of the corporate culture of the enterprise allows to assess the degree of its stability, its competitiveness, to suggest possible directions of management decisions and achieve the planned results. Moreover, the corporate culture "contributes to sustainable innovative development" (Kyurova & Koyundzhiyska-Davidkova, 2018, p. 128). Corporate culture is the major socio-cultural factor for the improvement of the activities of an enterprise. (Filipova, 2021, p. 588) It influences the achievement of good economic results - efficiency, effectiveness, sustainability and profitability. A well-developed company culture is extremely useful for the ongoing processes in the organization. „It is an important indicator of the strategic decision-making process in the organization" (Yaneva, 2021, p. 352). The people in the organization are required to be committed, active, to be able to work in teams, to show creativity, responsibility and productivity, whereas the leaders are required to show recognition (Borisova, 2017, p. 143).

2. STAGES OF FORMATION OF THE CORPORATE CULTURE

Corporate culture covers all the recognized rules, values, established traditions, habits and aspirations, formed at the establishment and formation of an enterprise, which are accepted and performed by its members (Filipova, 2021, p. 129). At first glance, the company culture is something very simple, but it is not easy to build the perfect culture that carries an energy charge. This depends on the leader's personality, his knowledge, skills and leadership qualities. If he wants people to be engaged, they need to be involved in work processes and be motivated to achieve more. If he wants people to participate in the life of the company, they must be trained to show devotion and loyalty (Borisova, 2017, p. 143). Establishing the stages in the process of forming the corporate culture is important for increasing the efficiency of this process.

In building a corporate culture that supports the development strategy of the organization, management must consistently go through several main stages.

- Mission selection of the organization, defining the strategies, main goals and values.
- Study of the existing corporate culture. Determining the degree of compliance of the existing corporate culture with the strategy for development of the organization developed by the management .
- Development of organizational activities aimed at the formation and development of the desired values and patterns of behavior.
- Targeted impact over the corporate culture in order to eliminate negative values and develop attitudes that contribute to the accomplishment of the developed strategy.
- Evaluation of the success for the impact on the corporate culture and introduction of the necessary corrections.

2.1. Mission selection and development of the organization's strategy

In this respect, the main characteristics of the external environment of enterprises, such as: its strong instability and high dynamism, the constant intensification of competition in industry and / or regional markets, extremely rapid development of information technology, have a strong influence. (Dimitrova, 2014, p. 5) Each organization exists because of a specific purpose and mission, because of a particular social function. (Borisova, 2017) Corporate culture management aims to receive better feedback from the staff, to create conditions for self-motivation of staff within the norms and rules of behavior adopted by the company. (Prokopenko, 2011, p. 170) The corporate culture is designed not only to stimulate the increase of productivity and quality of work of the employees, but also to support the mission and strategy of the organization. In fact, it is about the formation of an effective corporate culture for an organization, which cannot stay unchanged due to the change in external conditions and this requires its constant development. This activity is guided by senior management and requires a deeper understanding of the role of strategic management of the company and human resource management. Changes in the cultural values of the society and in the value priorities of the employees in the organization must constantly be monitored.

2.2. Study of existing corporate culture

In order to change and develop the company culture in accordance with the requirements of the company's strategy, first it is necessary to be fully explored. Before making changes, two questions must be answered:
1) What is the current corporate culture?
2) What should be the corporate culture so as to support the company's strategy?

Once the desired state of the corporate culture has been determined and its existing state has been established, a decision can be made about those actions that will allow to move from the existing state to the desired one. The study of culture can be done in many ways: interviews, study of oral folklore; examination of documents; studying the rules, traditions, ceremonies and rituals existing in the organization; study of the existing model of human resources management and management style.

2.3. Methods for forming the corporate culture

Today, various methods have been developed that enable managers to create and maintain the corporate culture which is necessary for the success of the strategy and for the development of the organization.

Different corporate cultures are effective for different countries and industries, so that there cannot be determined only one optimal company culture that can be formed in each organization or in a given country. After there has been established what requirements must be performed by an organization's culture, in the context of a concrete development strategy, management must determine what the philosophy of management should be. Based on the philosophy of management, the leaders of the enterprise outline principal methods for forming an effective organizational culture. In principle, the management of the enterprise can influence the development of culture in two ways. The first method is an assessment of the culture and its perspective for development from "above" with the expectation that this will lead to enthusiasm and support from most members of the organization. This method requires a sincere personal commitment from the manager to the values he believes in. The application of the second method starts from the "bottom" and managers must monitor what values exist in each department in the organization, trying step by step to influence the culture of the organization in the desired direction.

2.4. The role of the leader in the formation of corporate culture

As sources of corporate culture Schein points out: 1) the views, values and ideas of the founders of the organization; 2) the collective experience gained from the creation and development of the organization; 3) the new attitudes, values and beliefs introduced by the new members of the organization and the leaders (Shein, 1985, p. 111). The first source is crucial for the formation of the organization and, consequently, of the corporate culture, because the founders determine the main purpose of the existence of the organization – a mission and principles of interaction, as they select employees who are supporters of the main issues and direct and regulate techno behavior. The combination of what the managers pay attention to and what they do not pay attention to, allows the subordinates to get acquainted with their notions and ideas regarding various aspects of the organization's activity. (Zlateva, 2020, p. 172) The activities and problems to which managers pay special attention provide information about their priorities, goals and views. (Shein, 1985, p. 115) If they focus on too many things or are inconsistent in choosing objects of their particular interest, subordinates use other signals or their own experience to determine what is really important. As a result, there is a very wide range of points of view in the organization and a large number of subcultures are formed. "In cases where the organization is in a crisis situation, the outcome proposed by its leaders and employees leads to the formation of new norms, values and working procedures and defines important basic beliefs. Crises are especially important in the formation and distribution of culture, as increased emotional tension characteristic for these periods allows to increase the intensity of training. Crises cause anxiety, and its reduction is a powerful motivational tool for the acquisition of new knowledge." (Shein, 1985, p. 207) Therefore, "it is important for effective business management to study and know the processes that accompany the emergence and the course of crisis situations, as well as the opportunities to overcome them (Kyurova, 2013, p. 19). "If founders or managers want to instill their values and beliefs in their subordinates, they must create an appropriate system of incentives and development. Immediate messages determined by the daily behavior of the leader can be supported in a long-term plan by the incentive system adopted by the organization. If the messages at different levels contradict each other, a conflicting organization with a predominantly unclear culture or no culture at all may result" (Stephen & Bechtel, 1996, p. 147). "In small organizations, composition, structure, architecture, rituals, and official statements are factors of consolidation rather than culture formation. When an organization enters a stage of maturity and stability, the same mechanisms become primary "culture-creating"mechanisms which will limit the actions of the future managers.

If the mechanisms are not contradictory, they will contribute to the creation of organizational ideologies and formalization of informal lessons learned in the initial period of the organization's existence. If the mechanisms are contradictory, they will either be ignored or become a source of conflicts" (Shein, 1985, p. 213). The experience of a number of successful companies shows that managers adhere to team management. S. Betchel points out that the attention in team management is focused on: (Stephen & Bechtel, 1996, p. 148)

- taking into account the financial interests of consumers;
- ability to inspire subordinates to achieve future results;
- strengthening the sense of ownership among the members of the management team;
- creating an atmosphere of trust through personal example for a high standard for quality in work.

In order for the management team to work effectively, each of its members, apart from the position they hold, must be ready to delegate authority to their colleagues, to be open to critical self-assessment and evaluation of colleagues, maintain discipline and maintain tolerance in the most difficult conditions (Bogdanska, 2019, p. 71). High efficiency of the team is based on the mutual trust of its members. S. Betchel emphasizes that in the early 90's a completely new era in the life of business structures began: internal competition between managers in companies was replaced by cooperation. It finds a concentrated expression in the team approach, which offers a clear distinction between the powers and the level of responsibilities of leading company leaders.

3. MORAL AUTHORITY

Betchel accepted as the basis for the formation of an effective culture the need for the leader to become a moral leader. (Stephen & Bechtel, 1996, p. 150) The leader can become a moral leader in the organization only when he is ready to effectively perform the functions of moral authority within the existing corporate culture. (Burlachuk, 2000, p. 92) For the purposes of the study, it is necessary to focus attention on the specifics of the functions of authority. According to Betchel, the mechanism of the process of functioning (strengthening) of moral authority includes the following functions: (Stephen & Bechtel, 1996, p. 151)

- An incident in the activity of the organization related to a situation of moral choice and moral conflict. Turning to moral authority in order to find a "way of salvation" (way out of a crisis situation) - a prophetic function of moral authority.
- Presentation by the moral authority of the moral principle, on the basis of which the justification (correctness) of the chosen option for resolving the crisis situation is revealed - verification function of the moral authority.
- Determining by the moral authority of the hero (heroes) who acted during the incident, in accordance with moral principles and the creation of "legends" that contain a recipe for morally justified actions in a crisis situation - a legitimizing function of moral authority.
- This legend becomes one of the main scenarios of the corporate culture, and the behavior of the heroes becomes a role model. The cult towards heroes illuminated with moral authority - an institutional function of moral authority.
- Reassessment of moral authority in a crisis situation: it is regarded as a precedent in a series of possible similar events - a function of prediction.
- Critical analysis of the crisis situation in order to prevent possible extremes in the future. Creating a moral authority of the canonical version of the incident (organizational myth) - a narrative function of the moral authority.
- Establishment of new norms of behavior and moral sanctions for violation of the prohibitions - a taboo function of moral authority.

The mechanism of embodiment in the corporate culture of new norms, principles and models is the content of the activity of the moral leader (Bazarova & Eremina, 2002, p. 55). Founders often have a coherent theory of how organizations are designed to be most effective. The character of the organization and the structure of construction of the organization are determined by the idea of the head- founder of what should be the principles according to which the employees of the organization act (Stephen & Bechtel, 1996, p. 214). When the new leadership heads the organization, it obtains the existing structure and culture as a limiting condition. "Management is forced to work within these restrictions, which are designed and implanted without bearing in mind the particular qualities and management style of the previous manager" (Nedelcheva, 2018, p. 201). The formation of joint experience of the members of the organization as a social unit is created in the course of solving two main problems: the problem of external adaptation and survival and the problem of internal integration. They are presented in Table 1.

Problems of external adaptation and survival	Problems of external integration
Defining the mission of the organization, its goals, choice of the strategy for the accomplishment of the mission. Setting goals based on consent. Defining the methods for achieving the goals (choice of organizational structure, system of subordination and incentives). The development of criteria for measuring the achievement of organizational results (information and control system). Establishment of the type of corrective actions. Explanation of the successes and failures, providing information about the opportunities and successes to the representatives of the external environment.	Choice of communication methods (common language and concepts used). Creating memberships in the organization and its groups. The development of the rules for obtaining, maintaining and losing power, the distribution of statute in the organization. Defining rules for interpersonal interaction. Formulation of desired and unwanted behavior (punishment and rewards). Development of ideology and religion in the organization.

Table 1: Main problems in the formation of joint experience of the members of the organization
(Source: Stephen, D. & Bechtel, J., 1996. Reflections on success. Daedalus, 125(2), pp. 148)

In addition to creating moral authority, there are standard methods that are more objective and less dependent on the personality of the leader and that contribute to the implementation of the desired values (Lipatov, 1997, p. 65). Economic methods are related with free and contractual commodity-financial relations on a mutually beneficial basis and reflect the desire of employees to achieve the main goal of the organization. Economic methods are used so as to influence the vital needs of employees. By reducing the importance of financial incentives, they contribute to promoting the needs on a social, spiritual and creative level. "The economic stability of the enterprise, participation in ownership, profit and / or in the decision-making process are bonuses that demonstrate the effectiveness of the principles, values and norms of behavior encouraged by management" (Atanasova, 2020, p. 91). To administrative methods we can relate the methods of direct, formal guidelines of principles, standards, norms and rules of behavior in combination with administrative sanctions by the management of the enterprise, based on the relationship of power and subordination, such as statutes, work schedule, organization of disciplinary relations, information.

Administrative methods differ with accuracy, distinctness, unambiguity and stability, which allows employees to quickly adapt to them, as well as their application when controversial situations arise. Administrative methods are in line with the company's development strategy and personnel policy. They are very effective when normative regulation of the activity prevails and are used in combination with the system of incentives. To the administrative methods for forming a corporate culture can be attributed the criteria for staff selection, staff development and training, the formation of the mission, strategy and structure of the organization, the distribution of roles and responsibilities. Psychological methods are related to the use of group processes for influence over the personality that is part of the workforce and the individual, especially by authoritative employees (group pressure, influence). Also, psychological methods affect the personality and characteristics of the perception and assimilation of the relevant models of behavior. It has long been proven that people best learn new models by imitation. The leader must become a model for imitation, to set an example of such an attitude to work, which should be formed and developed in subordinates. Psychological impact is possible not only by creating psychological pressure or impact. The introduction and demonstration of the effectiveness of cultural models makes it possible to really see where the development of culture in a certain direction leads, forms conviction and removes limitations. Symbolic methods are related to the material embodiment of the main ideas and values of corporate culture (in the form of symbols, slogans, logical and semantic associations, behavioral cultural forms, etc.). These methods are aimed to the production and use of cultural forms, which purpose is to capture and transmit the cultural experience of the effective interaction of other generations of employees. These methods are characterized by a lot of emotional intensity, which attracts employees to use them, high speed of impact, they concentrate in themselves semantic and technological ideas. Symbolic methods make it possible to distinguish one community from another, giving it a unique color. One person is more susceptible to the impact of these methods because of his emotionality. Symbolic methods are good because depending on the direction in which corporate culture is changing, different meanings can be given to symbols without changing their appearance, which creates a sense of continuity and stability. In conclusion, we will point out that the methods used to form an innovative corporate culture must be used in combination, which acts upon all aspects of the activity of the enterprise. Some of them require quite large costs, for example remuneration for certain behaviors, development of psychological training or invitation of specialists, development of measures to influence employees. Some of these methods require a one-time high cost, and maintaining the viability of the developed symbol forms is not very expensive, but rather requires a systematic approach to them.

4. MAIN EVENTS FOR THE FORMATION OF CORPORATE CULTURE

Various ways and tools that contribute to the implementation of the desired corporate culture can be applied (Steklova, 2005, p. 132).

4.1. The behavior of the leader

This is the most effective tool of impact, but also the most difficult to implement. Of course, the leader must start with himself. In fact, it is about the manager's perception of a new role for himself: not a boss who orders, but a leader who captivates with his example. Not every manager is able to change himself in the name of the prosperity of the organization. The trend is that the leader in the 21st century increasingly strives to become a leader and effectively manage the staff. The behavior of the manager is most clearly manifested and, accordingly, most strongly influences the employees to accept the proposed model of behavior in critical situations. The cultivated attitude in the organization towards the people and their mistakes is most shown in such moments.

4.2. Stimulation and motivation system

Human resources are one of the main factors for achieving and maintaining a sustainable high level of competitiveness, and hence for the prosperity of the enterprise. (Dimitrova & Vladov, 2014, p. 23) An experienced management body of an enterprise is aware of the fact that the key force in the achievement of the goals is formed by the qualities of people and their contribution to the common work. (Dimitrova & Sotirova, 2020, p. 165) Corporate culture is greatly influenced by which staff behavior is supported and which behavior is suppressed by existing management practices. (Yuleva, 2019, p. 79) What matters is how the management perceives the manifestation of independence and initiative on the part of the subordinates. The construction of a system of motivation is designed to form such behavior in employees, which is necessary for the best implementation of the strategy (Zlateva, 2013, p. 308). The principles of building a system of stimulation and motivation must take into account ethnic or national models of work, as well as those values, norms and rules of behavior that characterize the corporate culture of the enterprise. In the process of functioning of the motivation of work there is a transition from updated needs, which are realized by work activity, to work behavior which answers the strategic goals of the enterprise. As indicators for the efficiency of the motivation process can be defined: the inclusion or not in the activity of the enterprise; job satisfaction, which in crucial degree depends on the correspondence between the nature of the work performed and the interests of the person; work behavior.

4.3. Selection criteria in the organization

Each company possesses a variety of personalities – staff with a diversity of personal and professional qualities (Yaneva & Serafimova, 2020, p. 173). Recruitment and selection are a key element of the human resources management system. (Dimitrova, 2018, p. 145) It is necessary to determine which employees will be given preference: professionals with the necessary knowledge and experience to perform today's functions, or employees who at the required professional level are potentially more valuable to the company, as they can and want to acquire new skills to meet the challenges of tomorrow. „From this point of view, the education and development of human resources and their lifelong learning is important for both for companies and for individuals" (Dimitrova & Vladov, 2017, p. 187).

4.4. Personnel training

The training and increaseing of the qualification of the staff are designed not only to transfer the necessary knowledge to the employees and to develop their professional skills. "Training is an important tool for promoting and ensuring the desired attitude to work, to the organization." In the process of training it is explained what behavior the organization expects from its employees and what behavior will be encouraged and supported. From the point of view of the strategic management of human resources, it is very important that the training envisages the mastery by the employees not only of the professional knowledge that is necessary for the performance of the work, but also knowledge about the implementation of these functions which will be necessary after several years in line with the company's strategy. It is about a the system of lifelong learning. "In modern society, lifelong learning is defined as a critical factor for personal development and a guarantee of a successful career, as formal education is only a part of what a person learns in life" (Rizova & Dimitrova, 2017, p. 12). Therefore, "learning and continuous enrichment of people with new knowledge, skills and competencies are accepted by societies as an opportunity to meet the changes and challenges in the development of the modern world." (Rizova & Dimitrova, 2017, p. 166) Such an approach to the staff training supports the company's development strategy and is one of the most important conditions for the formation of such a corporate culture that allows employees to feel stability in their work, to be sure that even in a period of change they will be sought in the company.

4.5. Organizational traditions and customs

The culture of the company is fixed and transmitted in the traditions and the order that exist in the organization. At the same time the corporate culture can be affected even by accidental deviations from the established order. For example, if for some reason the management repeatedly fails to summarize the monthly results of work and congratulate and reward the best employees, this not only violates the established rules, but also shows the reluctance of the managers to share the declared values, which naturally reduces enthusiasm and the desire of employees to do their best while working.

4.6. Statements, invocations, declarations of the management

In order to consolidate the desired values and patterns of behavior, it is important to turn not only to the mind, but also to the emotions, to the best feelings of employees: "We must be first!", "The highest quality - is the key to our victory over the competitors!", " The best specialists work in our organization!". The feeling of confidence, pride and admiration affect the company's image.

4.7. The widespread introduction of corporate symbols

The experience of the best organizations shows that the symbols used on the packaging of the finished products, on the advertising materials, the company logo, the vehicles, the workwear, the souvenirs have a positive effect on the attitude of the staff to the company. The loyalty, commitment of the employees to the organization and the feeling of pride is growing. Values important for the company's strategy are disseminated through the publication of books and manifestos, public appearances and press-conferences of managers, publication in company's newspapers, posters, newsletters and videos, songs and anthems of the company.

5. CONCLUSION

The ultimate goal of human resources management is always to improve the work of the people in the organization. Corporate culture management is no exception. In order for culture to contribute to improving the effectiveness of the organization, it must maintain the company's strategy and mission. This activity is managed by the high-level management. Once formed, the corporate culture does not remain static, it is a dynamic phenomenon which changes constantly. Practice shows that in companies where the corporate culture is clearly expressed, the work of human resources in the enterprise is much more efficient. The corporate culture forms a long-term and stable motivation of the staff, aimed at the strategic goals of the organization. Based on the above, we can conclude that corporate culture is one of the most effective tools of attracting and motivating employees. One of the most important functions of the corporate culture is to support each member of the team, to reveal his individuality and talent.

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SUNNY BEACH - DESTINATION FOR MASS SEA AND / OR CLIMATE AND SPA TOURISM

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ABSTRACT

According to its strategy for development of the country as a world tourist destination [12], Bulgaria has set a goal in the field of tourism in the last few years - to cope with the famous summer sea, winter ski model, becoming a remarkable tourist destination all year round. In this way, its natural, architectural and historical landmarks will be used to the greatest extent and tourism will become a sustainable industry. Opportunities are opening up thanks to the development of ecological, wine, rural and urban tourism, along with the current "generally accepted, traditional" tourism based on the concept of a healthy lifestyle, as well as the accessibility of the tourist environment to people with disabilities. Product's diversification is key to the development of Bulgarian tourism. Our future is in the combination of tourist products and the development of year-round tourism. New forms of tourism are emerging and they are replacing traditional mass tourism [13]. These forms include innovative and specialized forms of "greener", experience-oriented tourism. A greener economy means new growth and job opportunities. Eco-design, eco-innovation, waste prevention and reuse of raw materials can lead to net savings for businesses [6]. The focus is on finding a sustainable solution for the use of natural resources to reduce the impact of companies on the environment. Good business practices or so-called socially responsible business practices are those mechanisms for adapting the corporation, in which it demonstrates a way of working and investing that supports causes in the name of public welfare and environmental protection [7]. In addition, the expansion of the tourist services' demand, as well as demographic changes, accelerate the need for segmentation of tourist products and the creation of a new type of complex services or complete tourist products, which include a high degree of new services. The purpose of this article is to consider the possibilities of the largest Bulgarian tourist complex - Sunny Beach as a destination not only for mass sea, but also for year-round climate and spa tourism. In fulfillment of the set goal, based on in-depth interviews with ten owners of some of the largest hotel complexes, conclusions and recommendations for the transition from summer to year-round tourism product have been formulated. In conclusion, the problems and challenges that need to be overcome in the coming years are outlined.
Keywords: *Sunny Beach, mass, sea, year-round, balneo, climatotherapy, tourism*

1. INTRODUCTION

With increasing the number of trips so does the number of tourists who get to know the cultural and environmental environment of the places they visit, and this affects their experience and way of life. With the development of tourism, there is a displacement of purely external factors of travel (such as demographic and climate) to internal factors, such as the desire for self-improvement and creative expression. The richer the travel experience, the stronger the desire for more travel. Therefore, people become travelers by profession, looking for new exciting experiences and closer contact with the communities they visit. It also changes the relationship between hosts and guests. People are looking for more real experiences, not speculative, fake ones. Tourists strive for and gain "deeper" and meaningful experience by changing roles, engaging in "voluntary" and "creative tourism". All this evokes a growing respect for foreign culture, as well as tolerance and acceptance of cultural differences.

As a result, implications for the tourism sector are emerging in terms of:

- Experienced tourists are competent about the organization of their trip and reservation systems. That is why they are looking for higher quality experiences and services.
- For some destinations it is difficult to build customer loyalty due to the smaller number of customers who return to the same place for a vacation every year. In addition, some destinations could find it difficult to relocate tourists to new areas and combat seasonality if they do not attract the core of the market from "repeaters".
- Some travelers want to get rid of the label "tourist". Local municipalities could meet this through various incentive measures.
- Increasing and developing the so-called "voluntary tourism".

Thus, there is a growing demand for the so-called personal travel. The tourist becomes more and more demanding, he becomes an "active consumer of tourist services". [4] He wants to control the choice of when he will rest, for how long, where, in what destination, what type of entertainment and leisure he prefers. The tourist offer should reflect this trend and turn its focus to specific tourist segments, to approach the tourist offers individually. "The specialization of the tourist offer determines and upholds the expansion of the market positions of the individual tourist enterprises mainly through the developed and offered tourist offer in accordance with the changing situation on the tourist market." [2] New target groups are emerging on the international tourism market. This trend is influenced by demographic factors such as population aging and changes in household composition. The new target groups are adult single travelers or couples, young tourists (18-25), families with large children or traveling large families, with members of different generations. Booking travel online is becoming common practice. More and more tourists expect to be able to plan their vacation with a few clicks of the mouse or via their smartphone, using various travel applications. Nowadays, the dissatisfaction of free-thinking individuals is increasingly being encouraged, who will always assume that life is better elsewhere. However, this search for a better life will probably be thwarted by the "trampling" of the uniqueness of places of rest and relaxation - when the difference is discovered, travel will decrease. For many people, travel is not a luxury but a part of life. This means that last-minute decisions, especially for short trips, will become common phenomenon. Freedom of travel will be extended to the elderly population and one-person households. This trend is already raising the age limit for the "youth" market from 30 to 35 years. New groups and communities with common interests are becoming the main resource for knowledge of orientation, entertainment and security. As medical services become more expensive in Europe, Europeans will travel to Asia and other destinations for a wide range of medical services at reasonable prices. Also, the highly developed medical services available in Europe provide an opportunity to develop medical tourism as a specific niche in the tourism market as a whole. The intra-European market for medical tourism will increase [5]. Demand for health-improving and stress-reducing products is growing in developed economies. But competition is also on the rise in some parts of Europe, where private capital is investing in upgrading old fitness and spa equipment. Consequences for the tourism sector as a result of this new trend in the tourism market are respectively:

- Need for more products for specific tourist niches and satisfying those tourists who can afford more freedom of travel.
- It will reduce the demand in some markets, as the trip will lose its brand.

Looking for different experiences, users will look for more valuable and intense experiences. As a result, there is likely to be an increased demand for "safe security" (such as adventure travel and sinister experiences) or the development of new target areas that offer "controlled restrictions" such as different inner-city neighborhoods.

On the other hand, the demand for products related to the mentality of people based on their inner experiences will increase. Spiritual health care will be linked to the existing boom of health products, spa and balneology, which will lead to the emergence of new markets. Health products will be referred to other products from the tourism sector and those related to leisure, and accommodation procedures will lead to the development of combined products in the field of health and recreational tourism. Based on the long-term goal of existence and functioning and given the crisis, the strategy of the tourism enterprise can be based on two points: a strategy of recovery and stabilization through continuous change and a strategy related to market development and cost reduction through transformative improvements. In order to achieve competitive prices and offset losses, some of the supporting initiatives could be:

- cooperation and mediation with international travel agents and tour operators in order to increase the sales of tourist products;
- simplification of administrative procedures and means for them through a data processing system;
- to increase the attractiveness of the offered tourist packages and services to introduce a system for quality service.[10]

2. GENERAL CHARACTERISTICS OF SUNNY BEACH

Sunny Beach is the largest and most popular seaside resort in Bulgaria, for whose coast and beach it has won the Blue Flag. The resort is located in a picturesque and ecologically clean bay on the Bulgarian Black Sea coast, near the town of Nessebar, the marina of the resort of Sveti Vlas and Bourgas International Airport (30 km). With its beautiful beach and its hundreds of bars and restaurants, many entertainment and shops and its developed infrastructure, the resort attracts thousands of tourists from around the world, and the active tourist season here lasts from May to October. The history of Sunny Beach is very similar to many coastal destinations around the world. The closest examples come from Mediterranean Europe, especially Spain, Italy and Greece, where the massive development of tourism began in large-scale decades earlier than in Bulgaria. It cannot be denied that the development of tourism has brought jobs and development in other infrastructure as well. However, the effects on the environment are detrimental, as there is no proper legislation to prevent construction or legislation that cannot be easily circumvented by bribery. Thus, the result is redevelopment as a result of the fact that until recently thinking about sustainability was not a major topic in the Bulgarian tourism industry. Although Sunny Beach is one of the first seaside resorts in our country and has a long history, it is not related to inherited cultural heritage. However, the opportunities for practicing cultural tourism are great, as nearby is Nessebar, recognized by UNESCO as a World Heritage Site, where different historical epochs meet, and the ancient churches that can be seen are 13. In the tourist complex itself the main and almost the only daily attraction is the beach, and in the evening tourists can walk along the long coastal footpath, visit various restaurants, buy gifts and souvenirs from the market and / or visit a bar, nightclub or disco. The climate in the resort "Sunny Beach" is characterized by hot summers and average July temperatures of 22-23 ° C. The beach is over 10 km long and in some places over 60 meters wide. The fine sand, the natural sand dunes and the gradually deepening seabed attract thousands of tourists from all over the world. The latest estimates show that the resort "Sunny Beach" has a radically changed current appearance, which is already significantly different from the idea of a resort area with hotels used only in the summer months by wealthy tourists.

2.1. Resources of sunny beach resort for climate-balneoturism

Tourist resources are distinguished mainly by their regional and territorial scope, they are the center, and some authors define them as the core of the tourist product. The availability of specific regional tourist resources attracts and projects the aspiration of individual tourists to

travel to acquire new knowledge, experiences and diverse impressions, combined with their needs for recreation, generate demand and take priority among potential visitors. Tourist resources are distinguished by their uniqueness and therefore have their immense attractiveness to tourists. The attractiveness, importance and advertising popularity of a regional tourist resource is measured according to the constant tourist flow [3]. The waters of the Black Sea in Sunny Beach and nearby Pomorie are typical, as one of the most valuable natural resources of the destination. The hydrothermal springs concentrated on the Black Sea coast are mostly used to increase the balneotherapy efficiency in the resorts, as "complex treatment and prevention is applied and the hydromineral procedures are combined in an appropriate form with other physical methods: therapeutic gymnastics and kinesitherapy, therapeutic massage and paraffin treatment, sauna, acupuncture, electrosleep, music therapy with rational psychotherapy, dietary nutrition and others, and if necessary, appropriate medical treatment is applied" [1]. The mineral springs of Bulgaria, still remain underestimated as an opportunity to raise the image of medical tourism, which is also not affected by seasonality and can attract more tourists from abroad with good its quality, unique resource and lower prices. When the favorable geographical position of the country, the diverse climate, the long sunshine and the natural resources are added to them, it can be said that the balneotherapy is a golden chance for the analyzed destination and tourist Bulgaria as a whole. According to the type of the healing factor, we distinguish the following types of tourism, with opportunities for development in the discussed destination [9]:

- Balneotherapy (balneological) tourism - its leading motive is the use of mineral waters for various types of healing procedures for tourists, which fully expresses the essence of healing tourism.
- Climate therapy tourism - it is characterized by the fact that it is based on the use of the healing and / or hardening effect of climate in an area where the combination of temperature, sunshine, wind, humidity, infrared and ultraviolet radiation are in optimal combination and have a beneficial effect on the human body.
- Climate-balneotherapy tourism - it highlights a combination of climatotherapy and balneotherapy tourism, using both types of healing factors, ie. mineral water treatment is complemented by the beneficial effects of the local climate. In an aging Europe, where the working age population is declining every year, the pursuit of a healthy lifestyle, but achieved in the most enjoyable way possible, is gaining popularity. Moreover, the National Health Insurance Funds are increasingly in favor of such costs. As a result of the COVID 19 pandemic, people are coping with the new pace of life, work models, calibrating their priorities and social values. From here, consumers of tourism services should expect greater responsibility and sustainability from tour operators and destinations. [8] Today, the pleasure of good health, entertainment in active health activities is part of the characteristics of this type of tourism.

8 branches with different currents pass through the territory from Sveti Vlas to Nessebar. The air, the mountain, in combination with these currents create something strange. These currents create a unique ionization of the air that cures lung diseases far more dangerous than the coronavirus.[14]

2.2. Research methods
For the purposes of this study, a questionnaire was prepared for interviews conducted with 10 owners of hotels located in Sunny Beach. Each interview lasts about 45 minutes. The interviews with each of the participants were conducted in free conversation and recorded on audio recording. At the end of each interview, the issues discussed are duly recorded.

In general, the questions can be systematized in the following thematic circles:

- The first thematic round of questions includes questions aimed at establishing the possibilities of Sunny Beach as a tourist destination for the development of climate and balneal tourism, whether the possibilities of the destination are used well enough in this direction and how this affects the employment of hotels. This circle includes the questions: How do you assess the state of Sunny Beach as a tourist destination and is it attractive enough for climate and spa tourism? Are the resources of the destination used well enough and appropriately for the development of these alternative [15] types of tourism?
- The second thematic round of questions is aimed at highlighting the problems faced by hotel complexes in their activities, as well as the problems facing the development of climate and spa tourism in the destination and the way they affect the activities of hotels. This group includes the following questions: Can you identify three main problems that you face every day in your work? What problems do you see before the development of climate and spa tourism? How do these problems affect your hotel business?
- The third thematic round of questions is aimed at highlighting possible prospects for development. The question falls into this category: In what direction can the climate and balneal tourism in Sunny Beach develop?

These three thematic sets of questions aim to highlight the main trends in development, on the one hand revealing the current state of the destination and how appropriate and successful use of its development opportunities, as well as how it affects the activities of hotels. At the same time, the main problems for which the people in the hotel industry have to look for working and flexible solutions stand out, as well as what problems they see in terms of the development of year-round tourism in Sunny Beach. The problems raised by the respondents in the research are also a basis for formulating possible perspectives. The study is not representative, it refers to the application of a qualitative approach to collect a sufficient amount of descriptive information to identify trends. The information gathered during the interviews is systematized in a form suitable for analysis, which allows to highlight the main advantages of Sunny Beach as a destination for climate and spa tourism, possible problems in the sector and specific proposals that would promote the development of the complex. as a year-round destination.

2.3. Research results
After the interviews, the information was systematized and analyzed in order to highlight specific trends in the research topic.

- With regard to the first thematic round of questions, the following summaries can be made: The participants in the study unanimously share the opinion that Sunny Beach Resort is an attractive tourist destination for both Bulgarian tourists and foreigners. The reasons for this can be found in the good combination of climate and natural resources in the area. Also, the proximity to Nessebar, part of the UNESCO World Heritage Site, the only active monastery on the South Black Sea coast - "St. George" - Pomorie, preserved historical attractions, hospitality (incl. accommodation, food, services), the value of tourism products and services. Respondents point out the advantages of the mild maritime climate in the resort, characterized by mild winters and cool summers, which has a beneficial effect on various chronic diseases. Along with the climate that stimulates the development of tourism in the region, the respondents note that they have natural deposits of healing mud in Pomorie, which is rich in chlorine, calcium, magnesium, hydrogen. Of course, the combination of favorable climate and rich deposits of healing mud are a prerequisite to conclude that the complex can become an attractive center of spa tourism. However, the respondents share a desire to change the image from a destination for mass, sea to one that offers both tourist

products, both for people suffering from various chronic diseases and for healthy people who seek peace and opportunity for relaxation, and not only in the summer months. Respondents in the study also share their observations on what activities tourists are involved in, and they present these views again in the context of the issue of the state of Sunny Beach as a tourist destination. The prevailing opinion among the participants in the study is that nearly 90% of the tourists in the city combine sea (summer) tourism with recreational, cultural, spa and spa tourism. Despite the fact that the majority of tourists visit Pomorie because of the balneological possibilities of the resort, the participants in the study share the unanimous opinion that the potential for development is not used fully and efficiently enough. This finding of the respondents can be perceived as a direction for improving the potential of the destination in the future. Respondents say that the favorable opportunities of the estuarine mud and the climate also affect the occupancy of hotels, which is highest during the summer season. The guests are mainly from Bulgaria, Slovakia, Poland, Germany, Great Britain, France, Belgium, Romania and Israel, of all ages. Most of them have incomes around the national average, of course, is not small and the share of those who have incomes above average. Also, participants in the study point out that foreign tourists who want to visit the complex plan their vacation early, unlike Bulgarians, who more often make decisions at the last minute. Respondents also say that Bulgarian tourists visiting Sunny Beach use mostly informal sources of information, and the Internet stands out as the most popular source of information for Bulgarians during the low season of the hotel, which is in winter and spring. They usually take advantage of the promotional packages offered for holidays such as Christmas, New Year, Easter, etc. Unlike Bulgarian tourists, foreigners use a variety of information sources to decide on their tourist trips. The dominant source for foreigners is the travel agency. The tour operator is perceived by the foreign tourist as a guarantor for the holiday, according to pre-announced conditions. Also, the number of foreign tourists who visit the destination many times is not small, as they were satisfied with the attitude they received and the tourist services they used. Based on the different approach to the organization of their vacation, hoteliers say that in order to reach more foreign tourists should use the active presentation of Sunny Beach at tourism fairs and exhibitions, commercials broadcast in prime time, not only our main broadcast. markets, services of bloggers, vloggers and influencers. For Bulgarians, on the other hand, according to the respondents, it would be successful to rely on a communication campaign that reaches directly to potential tourists.

- On the second thematic round of questions, which are aimed at highlighting the problems faced by hoteliers in their activities, as well as the problems facing the development of climate and spa tourism in the destination and the way they affect the hotel, the summaries are in the following directions:
  Respondents point out that the three most important problems they face in their daily activities are related to the change of the date of reservations and charter flights, the permanent lack of staff, as well as the noise after 11 p.m. Regarding the first problem, everyone hopes that with the end of the Covid pandemic, employment will recover and increase. The biggest concerns are about the workforce and its qualifications. As for the noise load, it is higher during the summer season, when there is a higher load than road transport. Excessive noise levels are also reported by public institutions located on the territory of the complex, especially after 23.00. These are mostly discos and nightclubs, which are mostly visited by young people who love nightlife. However, high noise levels are becoming a problem for hotel guests, especially those over 60 who are looking for peace of mind. It has been scientifically proven that noise has an unpleasant sound effect on humans, which over time can cause stress and illness.

Also, according to the World Health Organization, noise leads to an increased risk of heart attack, impaired learning abilities, contributes to an increase in traffic accidents. In addition, research shows that people become demotivated when there is nothing they can do to fight noise - they find it harder to solve their problems and abandon their goals. In order to limit the harmful effects of noise, in 2019 the municipality is taking action to update the Ordinance on Public Order Protection, and the purpose of the changes is to have clearer rules and stricter control. It obliges the establishments near the accommodation places to be soundproofed and strictly forbids the sounding of open areas of food and entertainment establishments for the period between 11 p.m. and 07 a.m. Canceled reservations are also noted as a problem by respondents, as this affects the revenue that hotels generate. As the main reason for the cancellation of reservations in the past season of 2020, participants in the study cite COVID - 19. Accordingly, COVID - 19 caused a serious financial crisis, which significantly affects consumer behavior and consumption worldwide, not to mention the Bulgarian consumer. As a result of COVID-19, the individual user begins to assess his needs very precisely. Undoubtedly, this shows his caution, but at the same time it leads to a reduction in consumption. This is because most consumers are mainly reviewing the purchases they plan to make in an effort to reduce spontaneous costs in stores. They stick mainly to what they need and need most. Secondly, among the consumers, in the conditions of coronary crisis, there is a manifestation of more rationality in spending. In practice, this means that due to the prevailing uncertainty, they are making less and less large-scale purchases, as well as stopping spending money on things they do not need at the moment.

- The third trend that can be seen in relation to consumers worldwide is that they limit the consumption and consumption of certain products. These include various types of cosmetic products, restrictions on tourist travel, visits to various cultural events, theaters and more. There is also a reduction in the withdrawal of quick loans, which is quite understandable, given the uncertainty about income and jobs. Therefore, it will not be an exaggeration to conclude that a large number of consumers limit their purchases, including tourist trips and reservations, because the uncertainty in front of them provokes them to save money and try to secure their near future in some way. Regarding the problems of Sunny Beach as a destination for year-round tourism, respondents unite around several leading challenges related to the lack of a comprehensive municipal policy to help turn the complex into a destination for tourism in the four seasons. Also, the respondents see as a problem and not well enough regulated issues regarding the use of natural resources. The third significant problem hindering the effective development of climate and spa tourism is the lack of advertising in this direction. Respondents report as a challenge the insufficient condition of the transport infrastructure in the city, especially at its entrance and exit. In the last 10 years, only partial repair works have been carried out on small sections due to lack of funds for their financing. Of course, these problems of the destination affect the activities of hoteliers in several ways. First of all, the respondents report that in order to attract tourists in winter, spring and autumn, when they are not in the active season, they have to work at reduced prices. Sometimes it turns out that even during the active summer season they encounter problems with full occupancy of accommodation. Therefore, they offer discounts for early bookings to sell the base earlier, which leads to lower profits. Secondly, the participants in the study share the opinion that in the territory of the municipality there is often a division between state / municipal business sites and private business sites. Accordingly, private economic operators are deprived of access to the free use of natural resources.

Third, respondents point out that they face the problem of incurring higher costs for advertising and marketing the tourism products and services they offer to attract consumer attention, as insufficient advertising affects employment and hence of the length of the season, which in turn reflects on income and staff turnover.

The third thematic round of questions asked to the respondents concerns the perspectives they see, and the answers given by them during the interview can be presented as follows:

- According to the respondents, the implementation of joint investments by the Municipality of Nessebar [16] in the improvement of the infrastructure in the city will have a favorable impact on the development of tourism. It is necessary to finance both the improvement of the existing infrastructure and the construction of new roads and pedestrian alleys in order to move in the complex and in the surrounding settlements freely and without problems.
- Respondents also point out as a perspective that has a positive impact on tourism and the implementation of better interaction between the public and private sectors, and here again draw attention to the fact that the municipality must invest in advertising the destination. In addition, future marketing research should be carried out.
- The participants in the study also suggest that the funds from the tourist tax be directed to events specified by the tourist entities realizing hotel occupancy over 30-35%.

In conclusion, the summary that can be made is that although the study is not representative, it provides a guide to what are the current trends in the development of climate and spa tourism in Sunny Beach. They fully illustrate the current situation, namely that we have good opportunities for practicing these types of tourism. Despite the problems, the hoteliers state that they have a clear goal and it is aimed at properly managing the resources at their disposal, as well as to offer professional and quality service to their customers.

3. PROBLEMS AND CHALLENGES

Established as an interesting and specific form of tourism, climate and spa is one of the alternative types of tourism that can be successfully practiced in Bulgaria, which has rich natural resources, picturesque and unique nature and numerous sources of mineral water. As a main and serious problem for their development in Sunny Beach, in general, can be pointed out the insufficient advertising for promotion as a destination for four seasons. The Internet and its growing role and importance for modern society mark a new era in the development of advertising, as virtual advertising is becoming a powerful tool for influencing and attracting a wider audience. Next, the turnover of staff in the tourism sector and the insufficient professional qualifications of employees in this field can be considered a problem. Namely, this imposes the need to think in the direction of continuous training of staff, because only in this way the business can ensure many trained employees who have the motivation to work and ambitions for development in the sector. On the other hand, the rational use of human resources is able to contribute to improving the quality characteristics of the tourist product, and this can certainly have a positive impact on the profitability of hotel enterprises. The crisis is a test to which well-motivated employees respond adequately and retain their enthusiasm for shared efforts for the benefit of the organization through action to overcome it. Staff motivation implies an open and open dialogue with management in order to overcome resistance to change when the implementation of traditional motivational systems is poorly effective. Motivational element is the clear informing of the employees about the measures that are taken in order to stabilize the situation and to guarantee their work in the company [11]. At the same time, it is important to attract to the vacancies people with abilities who are not afraid of change, are flexible and innovative in their actions, as well as recognize organizational goals as their own, and this requires working and effective approaches to their recruitment and selection.

Also, the still weak coordination between the institutions and other stakeholders can be highlighted as a problem in tourism. This, in turn, implies taking new decisions to form a coherent and coordinated policy of a wide range of interested competent authorities to create appropriate conditions for product development and improve the mechanisms of interaction between institutions with competences in the field of health tourism, among which the Ministry of Tourism, the Ministry of Health, the Ministry of Environment and Water, etc. Along with the mentioned institutions, the specialized product and branch tourist organizations at national, regional and local level, the municipal administration, in connection with the regional development, the tourist business, educational and scientific units, etc. are of great importance. All these challenges should not be taken as an obstacle, although in one way or another they hinder the full development of the sector, they should be considered as opportunities to consider in order to improve the opportunities for offering Sunny Beach Resort. "As a destination not only for mass sea, but also for climate and balneal tourism.

4. CONCLUSION
The interaction of different bodies and institutions is the basis of prosperity. Effective management of health tourism requires good interaction and active cooperation of the structures of institutional and economic management at national, regional and local levels. This fully applies to the other participants in the process of forming the final tourist product. Infrastructure, redevelopment, environmental pollution and all problems in this aspect must be solved. All these shortcomings are major factors in how much Bulgaria will be a desirable holiday destination. We are highly dependent on maritime tourism, which is no longer enough for the tourist and the needs and requirements are changing, and our competitors are doing quite well with the integration of innovations in the supply of tourism products. There is a weak coordination between state institutions and private organizations, which further complicates the whole process of development and improvement of the sale of tourist services. Bulgaria lags behind global trends in the use of information technology and global standards in terms of digitalization, presentation and promotion of the country on the Internet. Global trends outline a growing demand for spa treatment and the growing development of health tourism. The growing interest in non-traditional and natural impacts on human health provides even greater chances for the development of the existing resort and healing potential of the country. It is mandatory to direct the advertising of Bulgaria as a destination with an emphasis on the opportunities that the country offers for the development of health tourism. Referral to tourists with special needs, who should be informed about the possibility in Bulgaria to practice specialized forms of tourism. Innovations must enter with full force in the management and development of the Bulgarian tourist product. It is absolutely necessary to focus our attention and work on meeting the needs of the tourist, because the individual approach and attitude is the basis of everything. It is inevitable that we learn to be good professionals if we want to be competitive in the regional, European and global markets. A quality tourism product must be a common goal for all of us. Together we look in one direction to the prosperity and development of Bulgaria as a year-round tourist destination.

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AN ANALYSIS OF THE IMPACT OF COVID-19 ON THE BANKING SECTOR IN SOUTH AFRICA AND THE UNITED KINGDOM

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ABSTRACT
The aim of the study was to analyse the impact of COVID-19 on the major banks in South Africa and the United Kingdom. The study analysed the consolidated financial statements of the South African and United Kingdom banks. A comparative content analysis method was used to analyse the data for the 2020 financial year. The study identified significant increases in impairment charges by the selected banks as a result of the COVID-19 pandemic. The study also identified inconsistent accounting practices by the selected banks in accounting for the impact of the virus. The study identified significant differences in the number and type of input factors used among the selected banks, as well as the macroeconomic scenarios developed for their expected credit loss models. The study suggests that the International Accounting Standards Board (IASB) should consider providing more specific guidance to ensure consistent accounting treatment that fully caters for force majeure events such as the COVID-19 pandemic.
Keywords: *COVID-19, South African banks, United Kingdom banks, financial reporting, global financial crisis*

1. INTRODUCTION
On 31 December 2019, the World Health Organisation observed severe cases of pneumonia of unknown cause in Wuhan City, China (McAleer, 2020). The virus later spread beyond China and on 11 March 2020 the World Health Organisation declared the novel coronavirus (COVID-19) outbreak a global pandemic outbreak (Cucinotta & Vanelli, 2020). Many countries implemented lockdowns to combat the spread of the virus, which restricted movements, gatherings and affected multiple business operations. On a global basis, numerous human lives have been lost to COVID-19 and the virus presented healthcare systems with pressing challenges (Liu et al., 2020). COVID-19 attracted a myriad of research interest in the last two years. In addition to the impact on the health sector the virus affected many other disciplines. Gautam and Hens (2020) considered the environmental impact of COVID-19. Da Silva et al. (2021) investigated the impact of COVID-19 on travel and leisure companies while Pokhrel and Chhetri (2021) analysed the impact of the pandemic on teaching and learning. Workie et al. (2020) deciphered the effect of COVID-19 on the agricultural sector and food security while Aday and Aday (2020) investigated the impact of the virus on the food supply chain. The evidence suggests that the virus has caused significant disruptions to economies and societies on an unprecedented scale (Gibson, 2020). Businesses had to adjust to having employees work from home, which altered how they operated and conducted business (Kaushik & Guleria, 2020:9).

At the core of most COVID-19 research the economic implications of the virus cannot be denied. According to Chi and Li (2017) banks are important participants in economic activities. Berger et al. (2004) affirmed the strong link between the financial sector and the economic activities of a nation. Haini (2020) advocated that access to finances provided by banks encourages economic activities and enhances financial development. Mansour and Alkhazaleh (2017) detected a significant positive association between measures of bank performance and economic growth. Twinoburyo and Odhiambo (2018) observed an increase in economic growth for financially developed economies with independent central banks. Furthermore, the banking sector is considered to be the backbone of economic growth (Gulzar, 2018). Banks do not only act as safe havens for depositors and provide financial assistance to the private sector and government, but also provide the infrastructure for strong macroeconomic and monetary policy performance. The interconnection between banks and the real economy is especially evident during financial crises (Bernanke, 2018). In South Africa, businesses that provided essential services were allowed to continue their business operations during the lockdown period. Essential service providers include individuals working in law enforcement and the medical field. The South African government also considers the financial sector to be a provider of essential services and banks were therefore allowed to keep their branches open during lockdown (Khambule, 2021). The lockdown restrictions resulted in fewer people visiting bank branches and alternative means of banking (Baicu et al., 2020). In addition, the lockdown restrictions resulted in an increase in unemployment and bank clients' inability to settle their loan obligations. This study empirically explores the impact of COVID-19 on South African banks during the lockdown restriction period. In addition, this study provides a comparative analysis of the impact of COVID-19 between South African banks and banks operating in the United Kingdom. This study is organised as follows. The next section provides a literature review of the important economic contribution of banks as well as an overview of the events during the COVID-19 pandemic in South Africa and the United Kingdom. The objectives and method are explained in the next section, followed by the results and discussion section. The conclusion is presented in the final section.

2. LITERATURE REVIEW

The world banking system had to weather many storms in the last two decades, including the financial crisis in 2008. During this time the focus has shifted from short-term profits to sustainability over the long term (Polyzos et al., 2018). Banking institutions are often required to reconcile the needs of key stakeholders and demonstrate a sustainable business strategy (Thinh, 2021). In order to ensure economic welfare, environmental quality, social cohesion and prosperity for future generations banks should play a vital role in addressing sustainable development goals (Avrampou et al., 2019). Banking institutions, as key enablers of the economy, are often exposed to various forms and types of risk. Sawafta (2021) described risk in the context of banks as the prospect of realising a loss in credibility, a financial loss or a loss of property. Duttweiler (2009) defined risk for banks as the imbalance between the maturity of assets and debt that leads to an imbalance between the source and the use of capital. Tran et al. (2019) suggested that risk is a necessary concomitant of the banking business and that loan loss provisions affect bank liquidity negatively. Zulfikar and Sri (2019) investigated the relationship between loan loss provisions and the financial performance of banks while Jasman and Murwangingsari (2022) considered the impact of risk on loan loss provisions. Many different reasons could give rise to loan loss provisions, also referred to as loan impairments in accounting terms. In the wake of the current pandemic the impact of COVID-19 on the operations of banks was the focus of several recent research papers. Abdelmoneim and Elghazaly (2021) as well as Rohman et al. (2022) investigated the implications of COVID-19 on the profitability of banks. Both Wahyuni et al. (2021) and Fakhrunnas et al. (2021)

considered the impact of COVID-19 on credit risk for banks. The levels of non-performing loans and loan restructuring during the Covid-19 pandemic were explored by Hardiyanti and Aziz (2021) and Damayanthi (2022) respectively. In addition, both Hawaldar et al. (2022) and Barnoussi et al. (2020) reviewed the effect of COVID-19 on capital adequacy and credit losses of banking institutions. These studies proved to be consistent with the events that unfolded in the South African and the United Kingdom banking sectors. There was an increase in the number of defaults during the lockdown, which caused the banks to be faced with high levels of doubtful debts and a significant increase in the provision for potential write-offs (Rumney, 2020). The increase in bad debts came with an increase in the number of credit impairments the banks had to make because of the widespread retrenchments and business bankruptcies during the pandemic (Wasserman, 2020). The South African government instituted financial support to employees who did not earn a salary during the lockdown period in the form of Unemployed Insurance Fund payments as well as a monthly tax subsidy of up to ZAR500 per employee. The South African Reserve Bank cumulatively reduced the repo rate by 2.75% in an attempt to make access to funding more affordable to consumers (South African Reserve Bank, 2021), while the National Treasury partnered with the banks to implement a loan guarantee scheme for Small and Medium Enterprises (SME) (National Treasury, 2020). The United Kingdom banks followed a similar approach, the Bank of England cut interest rates by 0.50% and launched a new term funding scheme that had additional incentives for SMEs (Bank of England, 2020). The Bank of England launched a UK£200 billion money creation scheme via a quantitative easing program (Elliot, 2020). Chancellor Rishi Sunak announced that UK£330 billion would be made available to businesses affected by the virus (Partington & Walker, 2020) and that government would pay 80% of the wages to employees who were not working, capped at UK£2 500 a month (United Kingdom Government, 2020). The lockdown negatively impacted the economy as the United Kingdom's gross domestic product (GDP) decreased by 10%, from UK£2 172 511 million in 2019 to UK£1 956 992 million in 2020 (Office for National Statistics, 2021). The lockdown had the same negative impact in South Africa, as the GDP decreased by 4%, from ZAR3 142 811 million in 2019 to ZAR3 006 813 million in 2020 (Statistics South Africa, 2020).

3. OBJECTIVES AND METHOD

The main objective of this study is to investigate the effect of COVID-19 on the banking institutions in South Africa and the United Kingdom. These countries were chosen because both countries have a well-established banking sector and the fact that certain banks operate in both countries. The researchers selected the four major all-service banks from South Africa and the United Kingdom, which were also the top four banks in each country. The banks are made up of retail banking which services individuals, business banking which services small-medium enterprises, corporate and investment banking which handles major financial transactions for corporates. The banks earn net interest revenue from the advancing of loans to their various clients as well as non-interest income in the form of fees for the various services provided. Although the selected banks operate in different countries, they provide similar products, to a similar type of clientele. The South African banks selected were ABSA, Firstrand, Nedbank and Standard Bank; and the banks from the United Kingdom were Barclays, HSBC, Lloyds Banking Group and Natwest Group. In this highly regulated sector, the financial statements in both countries were prepared in accordance with International Financial Reporting Standards (IFRS). Due to the comprehensive nature of the disclosure by each bank, the sample size is comparable with similar studies. Abusharbeh (2020) examined the financial soundness of the Palestinian banking sector, using a sample of six banks. Wahyudi et al. (2021) analysed competition and banking efficiency in four commercial banks of Indonesia. The 2020 annual financial statements were obtained for all the banks from the respective banks' websites.

For purposes of this study these financial statements represent the primary source of data (Ntuli, 2017) and the information disclosed in the financial statements the empirical data (Babaei et al. 2021). The study made use of a content analysis to analyse the financial statements and the relevant disclosure by the selected banks. Drisko and Maschi (2016) described content analysis as a systematic technique used to deduce information from a source in a credible and replicable manner. This method was utilised in a study by Verdenhofa et al. (2018) to analyse the theoretical approaches involved in foresight marketing. The researchers made use of a qualitative content analysis, as it is well suited for analysing and interpreting empirical data. Singh and Kaur (2012) used the content analysis method to analyse the selected websites listed features of the selected two banks. The researchers scrutinised the content of the financial statements and assigned unique codes to identified common themes pertaining to COVID-19 related information disclosed by the banks. The researchers then analysed the coded data to identify themes that were utilised to perform a comparative analysis between the banking institutions included in this study.

4. RESULTS

The financial statements included in this study were accompanied by the director's report, audit committee report, board risk committee report, independent auditors' report and the risk management report. The descriptive data of the selected banks is presented in Table 1.

Table 1: Bank descriptive data

Banks	ABSA	FirstRand	Nedbank	Standard Bank	Barclays	HSBC	Lloyds Banking Group	NatWest Group
Word	122	180	79	81	303	406	161	446
Pages	189	253	277	248	380	382	360	367
Issued Shares	847,75m	5 609,49m	483,89m	1 619,94m	17 359m	20 693,62m	70 839,21m	12 129,17m
Share Price	R119,86	R51,04	R129,48	R127,08	£146,68	£378,85	£36,44	£167,65
Market Cap (R)	101,61b	286,31b	62,65b	205,86b	51 042,51b	157 159,33 b	51 747,39b	40 763,44b

*Exchange rate as of 31 December 2020 (1 GBP to ZAR = 20.0464)

An initial word count revealed a significant difference in the appearance of the term COVID-19 in the financial statements of the selected banks. The UK banks used the term COVID-19 more frequently than the South African banks. The highest number was observed for Natwest Group (446 words) and the lowest observation was Nedbank (81 words). Even though the total number of pages of the UK banks appear to be considerably more than the South African banks, the weighted average word count per page of the UK banks (0.88) also exceeded the average word count per page of the South African banks (0.49). The statements of financial performance, statements of financial position and the statements of cash flows were scrutinised to identify significant movements between the 2019 and 2020 results, as well as to establish if there were new line items attributable to COVID-19. For all significant movements, the relevant notes to the financial statements were analysed to identify COVID-19 related disclosure. It was noted that the major movements across the selected banks comprised of impairment charges and a decline in profits for the year. Although a general decline in revenue was also observed, the main contributor to the decline in profits was identified as the increase in impairment charges for the 2020 financial year (the impairment charge also increased significantly as a percentage of revenue as illustrated in table 4). Based on the above, the focus shifted to impairment charges in order to get a better understanding of the main causes of this expense item in the financial statements of the banking institutions. Impairment charges, also referred to as loan loss provisions, is accounted for in accordance with International Financial Reporting Standard (IFRS).

IFRS 9 contains principles used for the financial reporting of financial assets and financial liabilities, and provides guidelines about the classification, measurement and recognition of financial instruments. IFRS 9 requires a loss allowance to be recognised for the expected credit loss of the financial assets. IFRS 9 states that on the assessment of a significant increase in credit risk, the financial statement preparer should use the change in the risk of a default occurring over the expected life of the financial instruments. It also states that preparers of financial statement should consider reasonable and supportable forward-looking information when determining a significant increase in credit risk (International Financial Reporting Standards Foundation, 2021). The expected credit loss should be measured in an unbiased and probability-weighted manner by evaluating a range of reasonably possible scenarios. It must use reasonable and supportable information available without undue cost and effort, including forecasts of future economic events. An entity does not need to identify all possible scenarios, but it should consider the risk or probability of credit loss occurring. This gives the financial statement preparers discretion on the number of factors to use in their expected credit loss models and the number of reasonably possible macroeconomic scenarios (International Financial Reporting Standards Foundation, 2021).

5. DISCUSSION

Table 2 illustrates the change in the net interest and non-interest income of the banks from the 2019 to the 2020 financial year-end. Lloyds Banking Group realised the highest increase in net interest income of 5.59%, while Barclays had the highest decrease in its net interest income of -13.66%. When comparing the selected countries' average change in net interest income, the South African banks had a 0.56% increase in the net interest income, while the United Kingdom banks had an average decrease of -5.31%. Barclays had the highest increase in non-interest income of 11.61%, while Natwest Group had the highest decrease in non-interest income of -50.90%. When comparing the selected countries' average change in non-interest income, the South African banks realised a -2.37% decrease in non-interest income, while the United Kingdom banks had an average decrease of -23.64%.

Table 2: Net interest and non-interest change

Banks	Total 2019	Total 2020	Change	Total 2019	Total 2020	Change
	(m)	(m)	%	(m)	(m)	%
	Net interest income			Non-interest income		
South African top four banks						
ABSA	R46 501	R48 857	5,07%	R33 619	R32 736	-2,63%
FirstRand	R31 602	R31 551	-0,16%	R22 173	R22 413	1,08%
Nedbank	R30 167	R30 081	-0,29%	R25 997	R24 140	-7,14%
Standard Bank	R62 919	R61 425	-2,37%	R47 542	R47 156	-0,81%
The United Kingdom top four banks						
Barclays	£9 407	£8 122	-13,66%	£12 225	£13 644	11,61%
HSBC	£30 462	£27 578	-9,47%	£40 562	£35 496	-12,49%
Lloyds Banking Group	£10 180	£10 749	5,59%	£32 176	£18 418	-42,76%
NatWest Group	£8 047	£7 749	-3,70%	£6 206	£3 047	-50,90%

Table 3 demonstrates the change in the impairment charge of the banks from the 2019 to the 2020 financial year-end. Natwest Group had the highest decrease in profit for the year (-111.42%), while Firstrand bank had the lowest decrease in profit for the year (-20.12%). When comparing the selected countries' average change in profit for the year, South African banks realised an average decrease in profit for the year (-48.23%), while the United Kingdom banks realised an average decrease of -55.47%. Natwest group accounted for the highest increase in impairment charges (365.80%), while Firstrand bank had the lowest increase in impairment charges of 58.65%. When comparing the selected countries' average change in impairments charge, the South African banks realised an average increase of 123.64% in impairment charges, while the United Kingdom banks realised an average increase of 239.55%.

Table 3: Profit for the year and impairment change

Banks	Total 2019	Total 2020	Change	Total 2019	Total 2020	Change
	(m)	(m)	%	(m)	(m)	%
		Profit for the Year			Impairments	
	South African top four banks					
ABSA	R15 980	R7 213	-54,86%	R7 816	R20 569	163,17%
FirstRand	R14 933	R11 929	-20,12%	R5 934	R9 414	58,65%
Nedbank	R12 810	R4 454	-65,23%	R6 129	R13 127	114,18%
Standard Bank	R30 696	R14 513	-52,72%	R7 964	R20 594	158,59%
	The United Kingdom top four banks					
Barclays	£3 354	£2 461	-26,62%	£1 912	£4 838	153,03%
HSBC	£8 708	£6 099	-29,96%	£2 756	£8 817	218,76%
Lloyds Banking Group	£3 006	£1 387	-53,86%	£1 296	£4 155	220,60%
NatWest Group	£3 800	-£434	-111,42%	£696	£3 242	365,80%

Table 4 illustrates the change in the impairment charge to revenue percentage, as well as the change in loans and advances issued to customers by the banks from the 2019 to the 2020 financial year-end. Natwest group realised the highest increase in its impairment to revenue percentage of 514.96%, while Firstrand bank realised the lowest increase in impairment charge to revenue percentage of 58.09%. Natwest Group accounted for the highest increase in loans and advances (9.86%), while Barclays had the highest decrease in its loans and advances (-0.79%). When comparing the selected countries' banks' average change in the loans and advances, the South African banks had a 3.40% increase in loans and advances, while the United Kingdom banks had an average increase of 2.82%. The drastic change in the impairment to revenue percentage shows further evidence of the key driver behind the banks' poor performance in the 2020 financial year-end.

Table 4: Impairment to revenue percentage, loans and advances

Banks	Percentage 2019	Percentage 2020	Change	Balance 2019	Balance 2020	Change
	%	%	%	(m)	(m)	%
	Impairment to revenue %			Loans and advances		
	South African top four banks					
ABSA	9,76%	25,21%	158,41%	R976 723	R1 014 507	3,87%
FirstRand	11,03%	17,44%	58,09%	R1 223 764	R1 222 120	-0,13%
Nedbank	10,91%	24,21%	121,85%	R824 786	R843 303	2,25%
Standard Bank	7,21%	18,97%	163,07%	R1 181 067	R1 271 255	7,64%
	United Kingdom top four banks					
Barclays	8,84%	22,23%	151,48%	£321 363	£318 827	-0,79%
HSBC	3,88%	13,98%	260,24%	£1 105 946	£1 119 603	1,23%
Lloyds Banking Group	3,06%	14,25%	365,57%	£504 763	£509 589	0,96%
NatWest Group	4,88%	30,03%	514,96%	£334 501	£367 499	9,86%

It is interesting to note that when analysing the change in the net interest revenue and non-interest revenue (see Table 2), there is a similar trend among the selected banks in terms of a decrease in the net interest revenue. A similar trend is evident with the decrease in the non-interest revenue. However, when looking at the change in impairments (see Table 3), no trend exists and there is a significant difference in the impairment movements. The impairment charge calculation is largely based on the individual banks' subjective judgement, which may be attributed to the significant difference in the impairment charge as a percentage of revenue (see Table 4). In the analysis of the respective bank financial disclosures, it was evident that generally, the selected banks did not provide separate disclosures that specifically addressed the impact of COVID-19. However, ABSA and Firstrand bank provided separate COVID-19 disclosures. The COVID-19 impact disclosure ABSA provided, detailed all areas that were affected by the pandemic, and included qualitative and quantitative data. The notes to the financial statements detailed the impact of COVID-19 in the respective line items; the main note was the loans and advances note, as well as the impairments note. Various other reports elaborated on the impact of COVID-19 on the banks.

The reports were the director's report, audit committee report, board risk committee report, independent auditors' report and the risk management report. The above-mentioned reports provided details about the banks' strategy in light of COVID-19 and the concerns, as well as measures that were taken to deal with the impact of the pandemic. This included controls put in place to ensure quality and business continuity, as well as the extra measures that were taken to deal with the risks presented by the COVID-19 pandemic. The banks placed great reliance on management's judgement in assessing the accuracy of the COVID-19 impact, the macroeconomic forecasts as well as associated impairments. The high uncertainty was a result of the ever-changing environment and the lockdown, which was implemented to combat the spread of COVID-19 and also affected economic activities. The various methodologies used by the banks in determining expected credit loss resulted in different levels of impairment adjustments. The selected banks use expected credit loss models to determine expected credit losses, incorporating risks of a default occurring in the developed macroeconomic scenarios of the banks. Tables 5 and 6 illustrate the factors were taken into account in the calculation of expected credit loss allowances. The tables also illustrate the number of macroeconomic scenarios each bank used in their expected credit loss model.

Table 5: Expected credit loss factors – South African banks

Expected Credit Loss model factors			
ABSA	**FirstRand**	**Nedbank**	**Standard Bank**
Real GDP CPI Average policy rate	Real GDP growth (Across all) CPI inflation (Africa) Repo rate (Across all) Real income growth (SA & UK) HPI (SA & UK) Household debt-income ratio (SA) Employment growth (SA & UK) Fixed capital formation (SA) Foreign exchange rate (SA) BOEBR (UK)	GDP Prime Rate HPI	Inflation % (SA, ROA, Global) Prime % (SA) Real GDP % (SA, ROA, Global) Employment rate growth % (SA) Household credit % (SA) Exchange rate (SA & Global) Policy rate % (ROA & Global) 3m T-bill rate % (ROA) 6m T-bill rate % (ROA)
Expected Credit Loss Scenarios			
Baseline Upside Downside **NB: Per Country**	Baseline regime Upside regime Downside regime **UK operations (Aldermore)** Severe downside Downside Stagnation Base Mild upside Upside **NB: Per Country**	Base case Mild stress Positive outcome High stress **NB: Overall average**	Base scenario Bear scenario Bull scenario **NB: Per Country**

Table 6: Expected Credit Loss Factors – United Kingdom banks

Expected Credit Loss model factors			
Barclays	**HSBC**	**Lloyds banking Group**	**NatWest Group**
UK GDP UK Unemployment UK HPI UK Bank rate US GDP US Unemployment US HPI US FFR	GDP growth rate Unemployment rate HPG Short-term interest rate	GDP UK Bank rate Unemployment rate HPG CREP growth	GDP – CAGR (UK)(EUR) Unemployment - Average (UK)(EUR) HPI – Total change (UK)(EUR) BOEBR – Average (UK) CREP – Total change (UK) ECBBR – average (EUR) World GDP – CAGR (EUR)
Expected Credit Loss Scenarios			
Baseline average Downside average 1 Downside average 2 Upside average 1 Upside average 2 **NB: Overall average**	Central scenario Upside scenario best outcome downside scenario worst outcome Additional downside scenario worst outcome **NB: Per Country**	Base case Upside Downside Severe downside **NB: Overall average**	Base case Upside Downside Extreme downside **NB: Per Country**

IFRS 9 does not provide specific guidance about the information that should be considered, aside from the risk of default in the determination of the significant increase in credit risk and the expected credit loss. The preparers of the financial statement may factor inputs in the credit loss models at their own discretion. In terms of IFRS 9 there is also no limitation on the number of probable scenarios that may be used to determine expected credit loss. Despite the fact that the selected banks operate in the same industry, provide a similar product offering to their clients and are generally exposed to similar market factors, the diverse information summarised in Tables 5 and 6 suggest inconsistent accounting practices and interpretations of the impact of COVID-19 on the banking institutions. As a result, it was deemed necessary to consider the assumptions of the credit loss models for each individual bank. The South African banks are discussed first, followed by a discussion of the UK banks.

5.1. South African banks

ABSA (2021) developed four macroeconomic scenarios (see Table 5) in its expected credit loss model to determine the expected credit loss allowance for the 2020 financial year. The bank used three inputs in its forward-looking information, which were factored into its expected credit loss model and the impairment charge for the year. ABSA considered other factors in the development of its macroeconomic scenarios, including economic growth, expected recovery, expected inflation, sector-specific impacts, business confidence, property prices, household spending, exchange rate fluctuations, unemployment rates, key fiscal responses initiated by governments and regulatory actions. ABSA mentioned that ten factors were considered in the expected credit loss model, yet only three are shown in the forecast table. The macroeconomic scenarios and forecasts were disclosed for each country the bank was doing business in. It allocated a 40% probability weighting to its baseline scenario, with a 30% probability weighting to both the upside and downside scenarios. Firstrand (2021) developed three macroeconomic scenarios for its South African operations and six macroeconomic scenarios for its United Kingdom operations (see Table 5). These were factored into its expected credit loss model, to determine the expected credit loss allowance for the 2020 financial year-end. For the forward-looking information, it used nine inputs for its South African operations, five inputs for its United Kingdom operations and three inputs for its other African operations. The macroeconomic scenarios and forecasts were disclosed for each country the bank was doing business in. Firstrand allocated for the South African operations a 57% probability weighting to its baseline regime scenario, 16% to its upside regime scenario and 27% to its downside regime scenario. For the United Kingdom, it allocated a 25% probability weighting to its severe downside scenario, 10% probability weighting to its downside scenario, stagnation scenario and mild upside scenario. It then allocated 45% probability weighting to its base scenario. Nedbank Group (2021) developed four macroeconomic scenarios (see Table 5) in its expected credit loss model, to determine the expected credit loss allowance for the 2020 financial year. It used three inputs in its forward-looking information, which were factored into its expected credit loss model and the impairment charge for the year. Nedbank considered other factors in the development of its macroeconomic scenarios, including the economic prime rate, gross domestic product growth, household debt-to-income, consumer price inflation and credit growth. The bank considered five factors for the forecast, but only showed three in the financial disclosures. The macroeconomic scenarios and forecasts were disclosed as an overall average for its entire operations. Nedbank allocated a 50% probability weighting to its base case scenario, 21% to its mild stress scenario, 21% to its positive outcome scenario and 8% to its high-stress scenario. Standard Bank Group (2021) developed three macroeconomic scenarios (see Table 5) in its expected credit loss model, to determine the expected credit loss allowance for the 2020 financial year-end.

For the forward-looking information, it used six inputs for its South African operations, five inputs for its African region and five inputs for its global operations. The macroeconomic scenarios and forecasts were disclosed for each country the bank was doing business in. Standard Bank allocated a 50% probability weighting to its base scenario, 20% to its bull scenario and 30% to its bear scenario.

5.2. United Kingdom banks

Barclays Plc (2020) developed five macroeconomic scenarios (see Table 6) in its expected credit loss model, to determine the expected credit loss allowance for the 2020 financial year-end. For the forward-looking information, it used eight inputs, which consisted of the United Kingdom and the United States' factors. The macroeconomic scenarios and forecasts were disclosed as an overall average for its entire operations. Barclays allocated a 20.2% probability weighting to its upside average 2 scenario, 24.2% to its upside average 1 scenario, 24.7% to its baseline average scenario, 15.5% to its downside average 1 scenario and 15.4% to its downside average 2 scenario. Based on the notes to the financial statements, it is evident that the expected credit loss model did not factor in the complexity in the macroeconomy as a result of COVID-19. HSBC (2021) developed four macroeconomic scenarios (see Table 6) in its expected credit loss model, to determine the expected credit loss allowance for the 2020 financial year-end. For the forward-looking information, it used four inputs in each country of operations. The macroeconomic scenarios and forecasts were disclosed for each country the bank was doing business in. HSBC allocated between 65 and 70% probability weighting to its central scenario for the four markets; then, it allocated between 20 and 30% to its two downside scenarios. Based on the notes to the financial statements, it is evident that the expected credit loss model did not factor in the complexity in the macroeconomy as a result of COVID-19. Lloyds Banking Group (2021) developed four macroeconomic scenarios (see Table 6) in its expected credit loss model, to determine the expected credit loss allowance for the 2020 financial year-end. For the forward-looking information, it used five inputs for its entire operations. The macroeconomic scenarios and forecasts were disclosed as an overall average for its entire operations. Lloyds Banking Group allocated a 30% probability weighting to its base case scenario, upside scenario and downside scenario. It then allocated 10% to its severe downside scenario. Based on the notes to the financial statements, it is evident that the expected credit loss model did not factor in the complexity in the macroeconomy as a result of COVID-19. Natwest Group Plc (2021) developed four macroeconomic scenarios (see Table 6) in its expected credit loss model, to determine the expected credit loss allowance for the 2020 financial year-end. For the forward-looking information, it used five inputs for its United Kingdom operations and five inputs for its Republic of Ireland operations. The macroeconomic scenarios and forecasts were disclosed for each country the bank was doing business in. Natwest allocated a 20% probability weighting to its upside scenario, 40% to its base case scenario, 30% to its downside scenario and 10% to its extreme downside scenario. Based on the notes to the financial statements, it is evident that the expected credit loss model did not factor in the complexity in the macroeconomy as a result of COVID-19.

5.3. Analysis of disclosure

When comparing the disclosure by the individual banks, the only input factor that was common in the macroeconomic scenarios was the use of the gross domestic product. All the banks took into account the probability of default, exposure at default, loss given default and forward-looking information in the determination of expected credit losses. IFRS 9 is not explicit on the number of reasonably possible scenarios the financial statement preparers should use, but the selected banks used a minimum of three macroeconomic scenarios in their expected credit loss models.

The macroeconomic scenarios that all the selected banks developed generally consisted of a base case scenario, upside scenario and downside scenario. ABSA and Nedbank use the same number of input factors for the expected credit loss models, while ABSA, Nedbank and Standard bank have the same number of macroeconomic scenarios. All the United Kingdom banks have four macroeconomic scenarios, except for Barclays, which has five macroeconomic scenarios. The selected United Kingdom banks use three similar input factors, namely gross domestic product, unemployment rate and house price index. Nedbank and Lloyds Banking Group disclosed macroeconomic scenarios on an overall average, while the rest of the selected banks disclosed macroeconomic scenarios on a country of operation level. The selected banks were affected negatively by COVID-19 and the implemented lockdown. This applies to all the selected banks; the degree of impact is however significantly different from one bank to another. ABSA and Nedbank used the same number of input factors, but the types of input factors they used are different, except for the GDP, which is used by all banks selected for this study. ABSA, Nedbank and Standard bank have the same number of macroeconomic scenarios, but they used a different number and types of input factors in the development of their macroeconomic scenarios. HSBC, Lloyds Banking Group and Natwest Group have the same number of macroeconomic scenarios, but they used a different number and type of input factors for their macroeconomic scenarios. In the analysis of the respective banks' financial statements, it was evident that two South African banks, ABSA and Firstrand, disclosed the impact of COVID-19 separately. None of the selected banks from the United Kingdom had a separate COVID-19 impact disclosure. The total number and types of factors used were inconsistent between all the selected banks. The number of scenarios also varied from one bank to the other. The probability weighting allocated to the scenarios differed significantly, even for the base case scenarios that were supposed to be the most likely scenarios to unfold in the respective banks. In general, the banks in the United Kingdom accounted for significantly higher impairment charges than the banks in South Africa. The impairment to revenue percentages were also considerably more than the South African banks. There is however no clear trend in terms of the change in impairments from one bank to the other, regardless of the country the bank belongs to.

6. CONCLUSION

Based on the above, it is evident that there is no standard method of disclosing the impact of COVID-19 in the financial disclosures of the selected banks. There are some similarities in the factors that were used in determining the expected credit loss and the number of macroeconomic scenarios developed by the selected banks. There is however a significant difference in the number and type of input factors used among the South African banks, as well as the macroeconomic scenarios developed for the expected credit loss models. The same difference is present in the United Kingdom banks. The significant increase in the impairment charge was higher in the United Kingdom banks than it was in the South African banks. Despite these differences all the banks included in this study complied with the requirements of IFRS and were audited by reputable audit firms. This meant that the financial statements were considered a fair presentation of the financial state of the banks amid the pandemic. As the selected banks used different input factors, number of factors and developed different macroeconomic scenarios for the expected credit loss models it is evident that more specific guidance is necessary to account for the effect of COVID-19 and similar pandemics. The article covered the impact of COVID-19 in selected banks, which was mostly affected by IFRS 9 because banks mainly deal with financial instruments. If a similar study was conducted on companies in different industries, the results of the COVID-19 impact would likely differ from those of this study.

Taking this into consideration, it would be prudent for the IASB to consider providing a separate standard that caters for force majeure events such as COVID-19, which will accommodate businesses in different industries.

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PUBLIC-PRIVATE-PEOPLE PARTNERSHIP (P4) FOR EVENT TOURISM MANAGEMENT PURPOSES

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ABSTRACT

The integrative nature of event tourism, as well as the present-day characteristics of tourism market, presuppose that partnerships are built. This paper defends the thesis that the implementation of the public-private-people partnership (P4) model helps to effectively realize the goals of event management and destination tourism through the inclusion and cooperation of all stakeholders. The identification of the P4 key characteristics that make it a working tool in organizing and holding events and realizing tourist visits is the main aim of the paper. The paper analyzes today's changes and challenges facing event tourism, highlights the most significant specific elements for the functioning of P4 and argues the applicability of this model in event tourism management for dealing with challenges, using resources efficiently, distributing benefits and building resilience. The impacts that event tourism has on local residents can be positive and negative, and involving them as a stakeholder in the event tourism management can contribute to limiting the negative impacts and enhancing the positive impacts for them.
Keywords: event management, event tourism, Public-Private-People Partnership

1. INTRODUCTION

Public-private partnerships (P3) are approved and widely applicable in providing tourism infrastructure and superstructure. This partnership model is based on urban planning research dating back to the 1960s. Subsequently, certain limitations of the traditional model focused on economic outcomes are manifested in public governance and a need arises for holistic approaches, including qualitative aspects such as democratization of the administrative process, social equality and community involvement. Public-private-people partnership (P4) places an emphasis on reconsidering the pragmatic issues that underlie public engagement and offers a process framework that places people as the main stakeholder in implementing public-private partnership schemes. This process framework of the public-private-people partnership covers bottom-up participatory strategies that make local population engagement, including in holding events, clearly visible for infrastructure planning and policy making. This elaborated framework and related strategies place an emphasis on citizens and their proactive engagement. It has the potential to help improve the process of planning and holding events by reducing the risk of unanticipated opposition, establishing clear responsibilities and rights, and creating opportunities for public input. Also, such an effective and operational public engagement framework would help event management to better respond to changing public demands. It is increasingly recognized that the responsibility for preventing, responding to and recovering from crises cannot rest with public authorities and businesses alone, but that citizens are also required to engage in achieving local resilience in order to understand the various perspectives on the same reality. In today's dynamic environment and constantly arising difficulties for the event tourism, the need for finding methods and means to improve its management stands out. The paper makes a systematic review of the literature regarding the P4 successful characteristics and their relationship with the attributes of event tourism management. The understanding of the need to determine which characteristics need to be developed in order to ensure more successful collaboration between the three main stakeholders: public entities, private companies and citizens is of key importance.

A two-pronged documentary research method is used: the first is based on desk research and secondary data analysis, and the second is based on observations and discussions with event management professionals and specialized bodies and associations.

2. TODAY'S CHALLENGES FACING EVENT TOURISM

It is widely agreed that tourism management practices need to be reviewed in the context of the unprecedented impact of the COVID-19 pandemic. There should be adaptive resilience to absorb pressure from external and internal threats given the prolonged and complex nature of the COVID-19 pandemic. Resilience focuses on developing processes by which participants can identify, adapt and use the resources to counter problems before, during and after a crisis in order to function reliably. The focus is on the individuality of an organization to build resilience through active resource mobilization (Faisal, Albrecht, & Coetzee, 2020) (Vargas-Sanches, 2021). (See Table 1).

Table 1: Evolution in tourism management

Basic value	Increasing management capabilities	New alliance with the community

• Intellectual humaneness;
 • Solidarity with the community;
 • Human centrality.
	• Anti-crisis contingency plan;
	     • Community management;
	     • Technology/Knowledge;
	     • Diversification.
		• ***Public-Private-People Partnership***

Source: Vargas-Sanches, A. A new tourism governance for a new time?// Hight-level Conference TORMAN 2021. On-line, May 2021.

The International Festivals & Events Association defines 2020-2021 as years of "unexpected reality" (International Festivals&Events Association, 2021). Research shows that these two years are used by event industry professionals to improve their knowledge and skills with a focus on technology and online event platforms as well as virtual event software. Where possible virtual events, online discussions, etc. are organized so as to keep the industry active and to connect with consumers in a virtual environment. An Allied Market Research report states that the expected compound annual growth rate (CAGR) of the events industry for the period from 2021 to 2028 is 11.2% (Vig & Deshmukh, 2021). In 2019, the segment of corporate events, seminars and exhibitions had the largest share among the types of events. Their implementation online or in a hybrid version also leads to an increase in the number of participants in this type of events, expanding their accessibility and geographical coverage. The costs of organizing events, which include on-site expenses for food and catering, entertainment, and the rental of premises, are expected to be limited in the future. As of 2019, the largest source of revenue is sponsorship, due to the opportunity for organizers to gain a competitive advantage by advertising goods and services and thus attracting a wide range of consumers. By 2028, sponsorship is expected to maintain a high share as a source of revenue for the events industry with a compound annual growth rate of 12.1% for the period 2021 - 2028. Forecasts for the period 2021-2028 are that entertainment music events will have the largest growth – 12 .4%. In terms of relative share and growth, corporate events will have a significant place, with the interest in entrepreneurship and business seminars standing out. It is expected that the hybrid model of this type of events will continue to be used in the future, which will reflect on a lower level of business event tourism. The activities of organizations related to event tourism during the pandemic are in a complicated state. On the one hand, they must comply with government and health measures for limiting the coronavirus pandemic, and on the other hand, maintain

their activities so that they can continue when the restrictions are lifted. In this sense, maintaining activity against the backdrop of COVID-19 requires (Gajjar & Parmar, 2020):

- *Safety of the event attendees*: organizers, participants, sponsors, spectators. It is necessary to comply with the current restrictions prescribed by the authorities: disinfection, distance, discipline, proof of COVID-19 vaccination and negative test result requirement, etc.
- *Communication.* The organizer must be responsible enough to send adequate messages and convey the necessary information regarding the precautions to be taken before travelling and participating in the event.
- *Financial planning.* Maintaining this type of business being impossible, the operating costs and marketing budget must be kept to a minimum.
- *Encouragement.* Although the period is difficult, this does not mean that all activities must be suspended due to event cancellation or postponement. The solution is to work from home, and along these lines the tasks should be formulated so that they can be carried out from home. Even after the restrictions are lifted and the organization of events becomes possible, the planning process and some other stages of work can be carried out from home.
- *Future planning.* Time should be used for planning future events, possible ways to organize, get acquainted with the technology trends, maintain relationships with key customers, etc. Time can be used to generate creative ideas and ways to survive in the future.

The wide range of challenges ultimately lead to complex crisis with unpredictable cascading effects that affect not only infrastructure but also societal well-being. Therefore, the traditional approach to event management will not be effective enough, and one of the directions for change is to increase the management's ability to include all stakeholders in the management process (Maraña, Labaka, & Sarriegi, 2020). Local residents' support for any form of tourism development depends on a number of factors. Studies have shown that residents' perceptions of the impact of tourism is one of the most significant determinants of their support (Gursoy, Chi, & Dyer, 2010). Since local residents directly interact with visitors, their support is seen as one of the most important determinants of the success of tourism development. With the support of residents, a tourism event can be transformed into an unforgettable and enjoyable experience for both hosts and visitors and support the sustainable development of the community. Studies dedicated to the process of forming the attitude of residents towards tourism development in their community, using the principles of the Social Exchange Theory (SET), come to the conclusion that residents form their attitudes based on the results of their assessment of potential benefits and costs of such development (Lee, Kyle, & Scott, 2012). A number of predictors that influence residents' perceptions and their support, such as residents' attachment to the community, values, place image, event attitude, and public trust, have also been identified (Ouyang, Gursou, & Sharma, 2017).

3. APPLICABILITY OF PUBLIC-PRIVATE-PEOPLE PARTNERSHIP IN EVENT TOURISM MANAGEMENT

The P4 model is a further development of the P3 model and includes the following groups of stakeholders: (i) *public bodies*, including central government, local government, regional and local bodies and institutions; (ii) *private entities*, including businesses, self-employed persons, private owners; (iii) *people*, including citizens, non-governmental sector, end users. The genesis of the idea for P4 relates to urban development, where it creates opportunities for proactive involvement and finding solutions not only in the early stages of urban development in planning, but also in the management of local economic and social infrastructure. Characteristic of this end-user-oriented model is that it assesses not only value-for-money results, but also includes criteria related to the life cycle of the place, diversification and customer orientation (Majamaa, 2008, p. 57).

In general, collaborative approaches lead to combining resources and valorization of activities, enhancing the exchange of good practices and the ability to create new networks. Involving the community in the implementation of projects, such as organizing and holding an event, leads to a more effective solution to common problems (Boniotti, 2021). The P4 model is defined as a modern form of integration, through semi-formal, semi-informal mechanisms. It is a perfect example of community involvement and engagement. It is a vehicle for urban regeneration and involves both individual citizens and non-governmental organizations, clubs, tourist information and visitor centres. In this model citizens play the role of co-designers, co-organizers and co-evaluators. Moreover, the P4 model is implemented in the context of shared trust and responsibility among stakeholders and is a meaningful convergence of investment from and management by various stakeholders in event tourism. The fact that risk is more easily controlled when all stakeholders are involved in the activity is not insignificant (Majamaa, 2008, p. 53). Owing to the Internet, P4 tools such as community funding, online petitions and contributions provided by foundations are growing. These are examples of self-organization which reflects as a response to the challenges of the complex system of place and society (Cameli, 2019, p. 33). Philanthropy, volunteerism and new technologies support this model. Digital technologies and social media have a key role to play and offer new opportunities in this regard. It is widely accepted that community engagement is essential to achieving sustainable development. In the context of the P4 applicability in event tourism management, partnerships are defined as purposeful strategic relationships between independent entities that share compatible goals, strive for mutual benefit, and recognize a high level of mutual interdependence. ISO 22397 "Societal security – Guidelines for establishing partnering arrangements" (2014) states that there is a variety of partnering arrangements, both formal and informal. These include, but are not limited to, contracts, memoranda of understanding, mutual aid agreements, cooperation agreements, coordination agreements, operational agreements and supply agreements. In the process of organizing and holding events P4s are mainly arrangements, both formal and informal, developed between public entities, private companies and citizens with the aim to improve the quality and competitiveness of the event, reflecting in attracting tourists and satisfying visitors and participants. Successful partnerships are those that achieve their intended purpose in an effective way, with the input of all partners involved. The characteristics of a successful 4P partnership are based on three categories of dimensions (Marana, Labaka, & Sarriegi, 2018)):

- *Stakeholder relationships*: the characteristics in this dimension relate to the qualities and attitudes that stakeholders need to have in order to work together successfully: commitment, coordination, interdependence, trust, integration, flexibility and inclusiveness.

- *Information flow*: the characteristics in this dimension relate to the communication channels and protocol that stakeholders should use to invest resources in the most effective way: information quality, information sharing, participation, information accessibility, information transparency and user-friendliness.

- *Conflict resolution*: the characteristics in this dimension relate to the techniques used to solve problems concerning the proper functioning of the partnership: constructive solution, reflexivity and perspectives.

The results of conducted empirical research show that within the framework of the outlined characteristics, the following elements are the most significant for a successful P4 partnership (Marana, Labaka, & Sarriegi, 2018):

- Stakeholder relationships. *Inclusion*: Building a sense of belonging is key to successful P4 partnerships.

- Information flow. *User-friendliness*. User-friendliness refers to the ease with which all partners understand and can use the information. It should be kept in mind that each type of

stakeholder needs access to different information to further enrich their knowledge on certain topics.

- Conflict resolution. *General perspective*. It includes an analysis of the personal interests of each partner and the ability to reconcile the different existing points of view and find a mutually beneficial goal.

There are interrelationships between the above-mentioned characteristics. Improving certain characteristics directly affects the performance of others. As a result, focusing on improving the most influential characteristics will provide a greater impact on the overall partnership performance. Considering the interrelationships that exist between the characteristics will allow resources (money and time) to be deployed in the most efficient way. These interrelationships will suggest an optimal order of execution to be considered in the future when developing successful P4s in the process of organizing and holding events. When studying the attitude of local residents towards the event, the following principal components are considered: (i) *tolerance* – relationships between organizers, participants, local residents and tourists; positive attitude and support towards the event; (ii) *impacts* – crowds, noise, infrastructure load and (iii) *disturbance* – disrupting personal routine and creating personal inconvenience (Weaver & Lawton, 2013). In terms of the above-stated, it is clear that the measures of the perception of an event by tourists can be significantly influenced by a successful partnership (Zahariev, Prodanov, Ivanova, & Kichukov, 2021). The P4 model evolves over time and helps to overcome challenges. This is done by taking into account the different perspectives of all stakeholders, developing trust between participants and having effective communication mechanisms in place to keep them informed and avoid conflicts and misunderstandings. It is important to note that creating multi-stakeholder partnerships like P4 is always challenging. There are certain barriers that prevent successful implementation. For example, one of the most difficult challenges for public entities is to foster citizens to be proactive. Another barrier to the successful development of P4 is that political interests can sometimes hinder the sharing of information between the parties in the 4P partnership.

4. CONCLUSION
Compared to P3, P4s are a broader form of integration of cultural, tourism and economic activities and a viable means of raising awareness and social participation in the event tourism sector. Besides economic and social impacts, event tourism also has significance for local residents. Local residents' perceptions of social impacts can be influenced by involving the local community in the event tourism management process, which also has the potential to help minimize negative impacts and enhance positive impacts. In line with the set goal, the study outlined the possibilities of the 4P model for contributing to event tourism management. It revealed the integrative nature of this tool and how it can contribute by involving local residents in the process of solving existing challenges. The inclusion of the local community in the process of planning and holding events is in terms of building their resilience, through representation of all layers of society. However, fostering cooperation between stakeholders who may have different interests and experience is also a challenging task. The identified significant characteristics should be taken into account in order to develop better and successful partnerships.

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COMPETITION ASSESSMENT OF THE PHARMACEUTICAL MARKET IN BULGARIA

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ABSTRACT
The pharmaceutical industry is one of the sustainable developing global economic sectors. Research, innovation and investment in new products and technologies have an extremely great importance to the growth of the pharmaceutical business. The consumption of medicinal products is growing steadily. The pharmaceutical industry in Bulgaria has a structuring role in the national economy. For the entire period after 1989, it is one of the few profitable and sustainable developing sectors of the Bulgarian economy. In addition to the importance of the pharmaceutical sector in purely economic aspect, its condition and development also have a strong social dimension and impact on the health care system and the health of the population. That is why importance acquire the issues relating to the assessment of the situation and development on the pharmaceutical market in Bulgaria. In this context the main objective of this article is to analyse and evaluate competition on this market. Methods for assessing the intensity of competition and the degree of monopolisation of the market are used. For the assessment of the competition of the pharmaceutical market in Bulgaria the Herfindal-Hirschmann Index and the Rosenblatt (Holl-Tydeman) coefficient are used.
Keywords: *Competition intensity, Competitive analysis, Evaluation, Pharmaceutical market, Monopolisation degree*

1. INTRODUCTION

The pharmaceutical industry is responsible for the development, production and marketing of medicines, which defines its undeniable importance as a global economic sector. Total pharmaceutical revenue worldwide reached more than one trillion US dollars in 2014. More than in any other industry, the pharmaceutical sector is highly dependant of research and development activities groups. Pharmaceutical companies invest 20 % and more of their revenue on research and development. When considering competitiveness, the structure of supply and demand must be taken into account (European Commisssion, 2019). In the pharmaceutical industry, for example, stakeholder behavior not only determines their differing interests in terms of costs and prices, but also determines the convergence of interests related to innovative and effective pharmaceutical products (Filipova & Nedelcheva, 2020, p. 227). The global market for pharmaceutical products are expected to grow by around 1.3 trillion dollars by 2020, representing an annual growth rate of 4.9%. According to S. Timofeeva the consumption of medicinal products is growing steadily, mainly due to: better diagnostics; the use of more modern treatment practices; the growing demand for more effective treatment; the increase in morbidity due to rapidly aging populations in the world and the associated increase in the number of chronically ill people; changes in lifestyle; environmental pollution; increased urbanisation; higher disposable income, etc. (Тимофеева, 2017, p. 168-170). The main export markets for pharmaceutical in the short term will continue to be traditional developed markets: North America, Western Europe and Japan, which have a high percentage of health expenditure per capita and streamlined regulatory processes. At the same time, the market growth is shifting to the emerging markets in Asia, Latin America and elsewhere, where pharmaceutical sales forecasts rise by double-digit number. The generic medical industry has made a significant contribution to ensuring patients' access to quality and effective medicines, to achieving

budgetary savings and to sustainable economic development and the creation of a gross domestic product. In many of the big economies, generics account for about 50% of the market volume. In the United Kingdom, the rate of generic medication is 71% of total market volume, in Germany 75% and in the US 89% (Jacovljevic, Nakazono & Ogura, p. 183). Generic medicines provide savings of € 35 billion to European health systems each year. Generic drug manufacturers provide employment for more than 150,000 European citizens. Generic medicines in the EU have a market share of 54% (in packages). The percentage of public spending on medicines used for them is 21%. Thanks to generic medicines for the period 2001-2013, the average price for drug therapy dropped by 60% and access to treatment increased by 200%. A report on the European economy states that policies promoting the use of generic medicines are the most used measure in attempts to increase the cost effectiveness of medicinal products (Mrazek & Frank, p. 246). A WHO report notes that promoting the increased use of generic drugs would lead to a limitation of expenditure on medicines and enhance their efficiency (Българска генерична фармацевтична асоциация, 2016).

2. KEY FEATURES OF THE PHARMACEUTICAL INDUSTRY IN BULGARIA

The Bulgarian pharmaceutical industry is generic and focused on satisfying the local market and the markets of the former Soviet republics, the Arab countries and the countries of the Middle East. Since 1989, it has undergone a complete restructuring and reorganization. Privatization of some of its existing production facilities is underway and some of the world's largest drug manufacturers are entering the sector. In parallel, a number of new facilities are being built. The pharmaceutical sector is one of the most highly regulated and is primarily driven by research and development. For the whole period after 1989 it is one of the few profitable and sustainable sectors of the Bulgarian economy. According to the World Bank report (World Bank, 2015), the pharmaceutical industry in our country has a structuring role for the national economy. Generic pharmaceutical industry makes a significant contribution to ensuring access for patients to quality and effective drugs, for the implementation of budget savings and for sustainable development of the economy and creation of gross domestic product. Manufacturers of generic drugs in Bulgaria are leading Bulgarian and international companies with a key role in the creation of gross domestic product. Production of medicinal substances and products covers approximately 1.6% of the industrial production in Bulgaria and created approximately 2.3% of the value added in the industry. In today's market conditions, it is very difficult to achieve stable business success if its effective development is not planned, if the information about the company's prospects and opportunities, the state of the target markets, the position of its competitors and its own competitiveness is not studied and analyzed (Филипова, 2004, p. 81). The pharmaceutical sector is fast growing and is characterised as a relatively cost-effective and with high-quality produce at competitive prices at a low level of expenditure on research and development. Bulgarian and foreign producers in the sector make significant investments in raising the productive capacity and modernisation of technical facilities in order to gain competitive advantages. In this context, M. Filipova believes that in order to be competitive, companies in Bulgaria must build their strategies on an absolutely new basis, based on new technologies, uniqueness of processes and products, meeting all the requirements of consumers and high quality of products (Filipova 2005). The strong traditions and geographical location near the Middle East and the CIS are also a prerequisite for it. Leading destinations for the export of Bulgarian pharmaceutical products are Russia (33% of total exports), Romania (14%), Croatia (10%), Ukraine (9%) and Serbia (7%). The sector provides employment of 6.7 thousand people (1.3% of employees in manufacturing industry). The level of wages in the sector is above average. In 2017 drug sales at wholesale prices, excluding pharmaceutical surcharges of about 15-20%, were estimated at 3.164 billion levs.

The revenue of the top 15 companies in the pharmaceutical sector also grows by 11% (Николова, 2018). Again, almost all companies in the ranking are profitable, with an average profitability of over 8 %, which is higher than in other sectors. The Bulgarian pharmaceutical market is worth 670 million euros. Similar to other Eastern European countries, Bulgaria has a high market share of generic medicines, which is 39%, while the share of the original is 61%. The value dimension of market originals drugs amounted to 400 million euros, as Bulgaria is one of the last places in the EU. Though small, the Bulgarian pharmaceutical market demonstrated growth and continues to grow, and in 2018, but with a weaker pace of previous years. The slowdown is already being felt and in April for the first time in many years the market for drugs declined by 2.8% (Николова, 2018). In 2017, there was also an increase in the sales revenues of the pharmaceutical companies in Bulgaria. According to IQVIA, the growth figure is 11%. Fonix Pharma is second in the sales revenue chart, using the technology as part of its digital growth strategy, which includes the development of software products closely related to the management of pharmaceutical sites. For 2017, the company's net sales increased by 8% in the pharmacy market and by 27% in the hospital market. With double-digit growth in sales over the past year is Sopharma AD, with growth in its export products. One exception to the ranking of successful Bulgarian drug manufacturers is Balkanpharma Dupnitsa, which has some of the largest manufacturing facilities for tablet formulations in Southeastern Europe. In 2017, the company recorded no sales growth, and there was also a reduction of staff for two consecutive years by 25% and 10% respectively (Николова, 2018). The market is slowing and sales growth drops to 5 % for the year, and forecasts for 2019 are for single-digit growth (Николова, 2019). Medicines represent a disproportionate share of healthcare expenditure in Bulgaria (38% of total health care costs, against a 25% average EU cost.). The burden of spending on medicines paid for by citizens' own resources is also excessive, amounting to around 81% of total pharmaceutical costs. At the same time, the rank of Bulgaria according to the value for the Pharmaceuticals subdomain of the European Health Consumer Index (ENCI) for 2012-2017 is very low (Dimitrova, 2018, p.11). The country is consistently one of the last places in the ranking of countries involved in the designation of the EHCI. What is worrying here is that the rapid increase in costs occurs without a clear improvement in health outcomes and is at the expense of population equality (Министерство на здравеопазването на Република България, 2015). Therefore, apart from the great importance of the pharmaceutical sector in a purely economic aspect, its condition and development also have a strong social dimension and impact on the health and public health system.

3. EVALUATION OF THE COMPETITION INTENSITY AND THE MONOPOLIZATION DEGREE OF THE PHARMACEUTICAL MARKET IN BULGARIA

Considering the above, issues related to the study of the situation analysis and competition in the Bulgarian pharmaceutical industry are of great importance in order to clarify the sources and the degree of competition (Александров, 2002, p. 78). The process of assessing competitiveness aims to form an accurate and objective judgment of its level (Nedelcheva & Filipova, 2021, p. 162). C. Fleisher and B. Bensoussan examine in detail the nature, content, features and results of applying different methods and approaches to industry analysis. According to them, industry analysis provides a structured analysis and overview of the participants and the features of each industry (Фляйшер & Бенсуссан, 2005, p. 87). There are a number of opinions in the scientific literature about the nature and main theoretical and methodological problems of competitive analysis. According to M. Porter, competition analysis is an important component of corporate strategy (Портър, 2010, p. 27). F. Kotler believes that competitive analysis consists of: identifying competitors and analyzing their goals, strategies,

strengths and weaknesses, behavioral models, market positions and the role of the target market - leader, candidate for leadership position, next a niche market (Котлър, 2005, p. 68). N. Kazakova focuses on the purpose of competitive analysis and points out that it identifies those features of the external and internal environment of the company that have the greatest influence on its strategic behavior and capabilities (Казакова, 2012, p. 25). Also interesting is the D'Aveni business environment analysis approach, which introduces the concept of hypercompetition, which is trying to counter attempts to enforce the static approach when considering the theoretical problems of the development of the strategy (D'Aveni, 1994, p. 219). The author makes and extremely important findings associated with the modern changes of the business environment (Kuzmanova, 2011, p. 55). On the basis of the opinions of the authors can be identified the following main areas of competitive analysis: analysis of the competitive structure of the sector; analysis of the intensity of competition and the degree of monopolisation of the market; preparing a competitive map of the market ; analysis of the strategic groups of competitors on the market. The pharmaceutical industry in Bulgaria includes the production of medicinal substances and mixtures and of medical products. According to data from the Register under Art. 19, para. 1, item 1 of the Law on Medicinal Products in Human Medicine (LMPHM) of manufacturers and importers of medicinal products on the territory of the Republic of Bulgaria and of the qualified persons under Art. 148, item 2 and under Art. 161, para. 2, item 1 the companies with production permits are forty-nine in number. After a comprehensive analysis of the activities of establishments for the purpose of the current study analysed companies, manufacturers of medicinal products for human use, in the form of a tablet, liquid and gel forms, as well as nutritional supplements, as well as the importers of medicinal products, which operate on an equal competitive conditions. The analysis and evaluation of the intensity of competition and the degree of monopolisation of the market is made by application of a system of indicators (Савельева, 2009, p. 153). In order to achieve the stated goal in the development, the next indicators are applied:

- Herfindahl-Hirschmann Index - it is determined by the formula:

$$IHH = \sum_{i=1}^{n} p_i^2 , \qquad (1)$$

where IHH is the Herfindahl-Hirschman's Index;
p_i - market share of i - company;
n – number of enterprises on the market.

As can be seen from the Table 1, depending on the degree of concentration (measured by the Herfindal-Hirschmann index), there are three types of markets (Агеева, 2002, p. 93) (Table 1).

Markets with a high concentration	$0,2 \le IHH \le 1,0$
Markets with a moderate concentration	$0,1 \le IHH \le 0,20$
Markets with low concentration	$IHH \le 0,1$

Table 1: Types of markets according to the concentration degree

- Rosenblatt's (Hall-Tideman) Coefficient – it is determined by the formula:

$$HT = \frac{1}{(2\sum_{i=1}^{n} R_i p_i - 1)} , \qquad (2)$$

where NT is the ranking index of market concentration;

R_i – rank of the enterprise in the market (defined as a decreasing parameter, with the largest enterprise having a rank of 1);

p_i – market share of the i enterprise.

The Rosenblatt (Hall - Tidman) Coefficient assumes values in the range of 1/n to 1 (n is the number of enterprises in the market). The closer the value of the Coefficient to 1, the less competition in the market (if a value of 1 is a pure monopoly). The closer the value of the Coefficient is to 1/n, the more intense the market competition is. Table 2 presents the values of the Herfindahl-Hirschman Index and the Rosenblatt (Hall - Tidman) Coefficient for the pharmaceutical market in Bulgaria for 2010-2021.

Year	IHH	HT
2010	0,1392	0,1071
2011	0,1342	0,0974
2012	0,1239	0,0909
2013	0,1192	0,0850
2014	0,1154	0,0834
2015	0,1243	0,0830
2016	0,1494	0,0988
2017	0,1515	0,0947
2018	0,1578	0,0991
2019	0,1601	0,0993
2020	0,1598	0,0993
2021	0,1602	0,0995

Table 2: Value of IHH and HT in the pharmaceutical market in Bulgaria for 2010 -2021
(Source: Own elaboration based on data from the Annual Financial Statements published in the Commercial Register, Retrieved from
https://public.brra.bg/CheckUps/Verifications/VerificationPersonOrg.ra)

Analysing the values obtained in the calculation of the Herfindahl – Hirschman's Index it is established that the pharmaceutical market in Bulgaria is a market with moderate concentration, as the values for the investigation period are between 0,1154 in 2014 and 0,1602 in 2021 (fig. 1). In terms of the dynamics of the index it is seen that, in the period 2010-2014 its value decreases, then increases to the highest value of 0,1602 in 2021.

Figure following on the next page
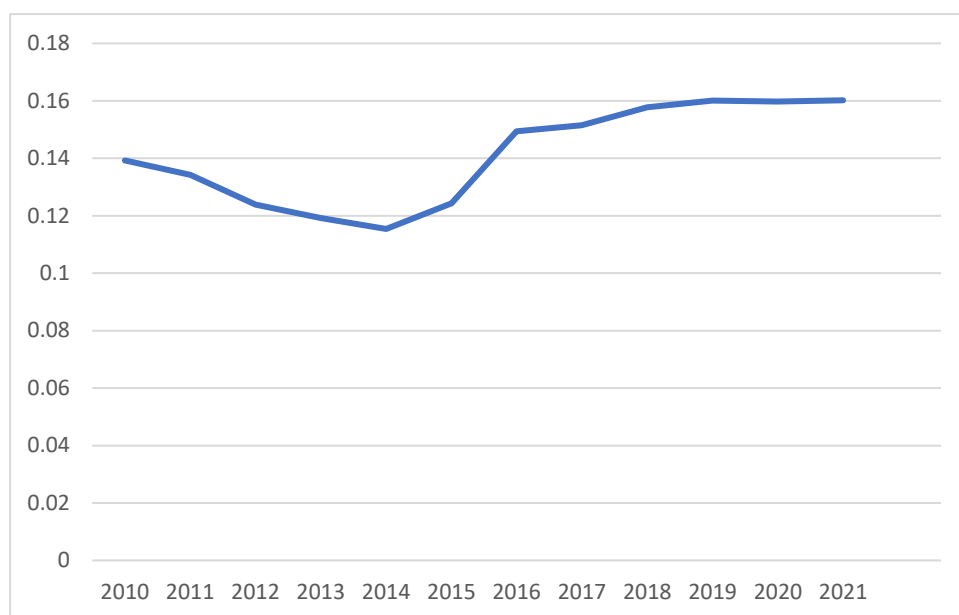
Figure 1: Value and dynamics of IHH for 2010-2021
(Source: Table 2)

The data in Table 2 shows that the Rosenblatt's (Hall-Tideman) Coefficient has values ranging from 0,0830 (2014) to 0,1071 (2010). These values are close to 0,0204 (1/49) and are significantly lower than 1. This makes it possible to conclude that for the period 2010-2021 competition on the pharmaceutical market in Bulgaria is intense.
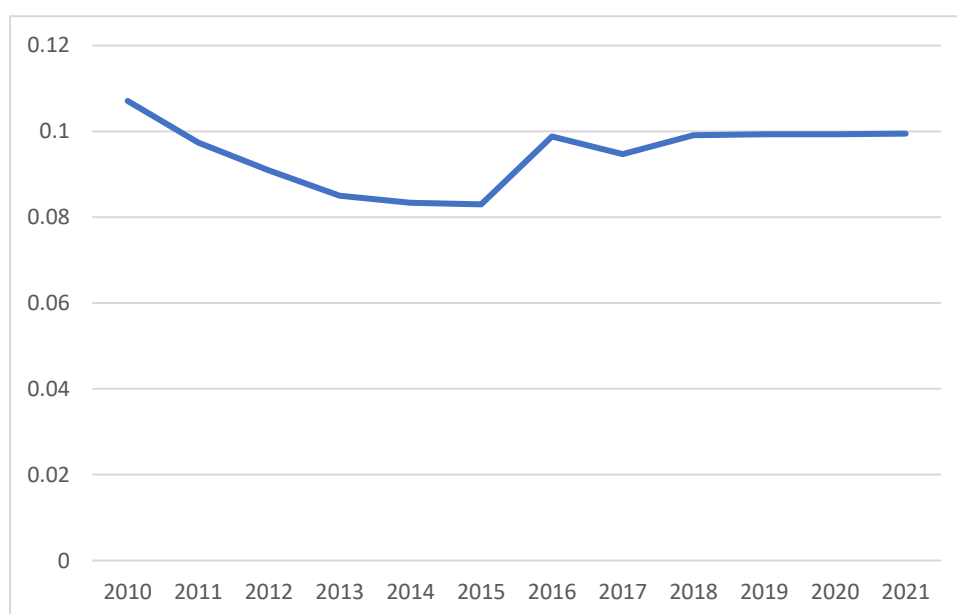
Figure 2: Value and dynamics of HT for 2010-2021
(Source: Table 2)

From Fig. 2. it can be seen that the Rosenblatt's (Hall-Tideman) Cofficient decreases its values for the period 2010-2015, then increases in 2016, decreases in 2017 and again increases in 2018-2021. The values of both indicators for analysis (IHH and HT) are decreasing at the end of the 2010-2014 period, then the values of the indicators fluctuate over the next years. This requires the analysis and evaluation of the intensity of competition and the degree of monopolization of the pharmaceutical market in Bulgaria to continue following the future processes in that market.

4. CONCLUSION

On the basis of the results obtained in the analysis, some general conclusions can be drawn:

1) The pharmaceutical industry in Bulgaria is developing sustainable and marks an increase of production and sales throughout the period after 1989.
2) The concentration degree of the pharmaceutical market in Bulgaria is moderate.
3) Competition in the pharmaceutical market in Bulgaria is intense.
4) There is a decrease in the intensity of competition and the degree of monopolisation of the pharmaceutical market at the end of the period 2010-2014.
5) During the period 2015-2021, IHH values increased, while HT fluctuated in 2015-2017 and increased in the last four years.

The dynamic processes in the pharmaceutical market in Bulgaria imposed objective need to analyse and evaluate the intensity of competition and the degree of monopolisation of this market further. The intensity of competition on the pharmaceutical market would be maintained and even increased due to the presence of favourable factors for the entry of new companies on the market, both foreign and ours. To these factors we can attribute the low tax rate of corporate income taxation in Bulgaria. The country is open to foreign investment because of the need to adopt a European and world standards of quality in the production and supply of the pharmaceutical products on the Bulgarian market, as well as by the continuous implementation of innovations, including in the case of generic companies. Regarding the degree of monopolisation of the Bulgarian pharmaceutical market the trend would increase if the big manufacturing companies in Bulgaria continue to grow by uniting their subsidiaries such as Sopharma and its subsidiary Medica as well and acquiring new production facilities for companies with problematic financial condition due to indebtedness to creditors. Currently, these processes do not affect the indicators measuring the degree of monopolisation and the intensity of competition on the pharmaceutical market in Bulgaria. This is due to two reasons: the number of companies operating in the market, has not decreased compared to past periods; no significant deviations in the market shares of those undertakings were found. The three leading companies in the sector forecast growth in sales for the current year. The success of the leading companies would be achieved by following the main thrust of consolidation, digitisation and a continuous process of implementing innovations which trends are applicable in a number of sectors, but especially in fast-growing and advancing industries such as IT, food industry and pharmacy.

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MAJOR FACTORS OF THE CURRENT INFLATIONARY PRESSURE

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ABSTRACT
The annual inflation rate has reached its highest level in decades across the U.S., Europe, and many other countries in the post-COVID-19 era. In 2021, the U.S. has even hit its highest annual inflation rate of 8.6% since 1981. American economist Milton Friedman has a well-known quote on inflation in the 1960s. "Inflation is always and everywhere a monetary phenomenon, in the sense that it is and can be produced only by a more rapid increase in the quantity of money than in output," (Milton Friedman). By definition, inflation is a monetary phenomenon as it refers to the process by which the purchasing power of money diminishes. While Friedman mainly attributes the inflation globally to prior increases in the money supply, this essay attempts to investigate that other than the increase in money supply, the change in the velocity of the circulation of money and the shortage on the supply side in the economy both play a significant role in the current inflationary pressure. The U.S. is used as an example in the essay as the U.S. has relatively comprehensive economic data and can most likely reflect the effect of COVID-19 on inflation in an efficient market. During the initial outbreak of COVID-19 in 2020, the change in the velocity of the circulation of money induced by COVID-19-related regulations, had a direct impact on the price level in the economy based on the Quantity Theory of Money, and eventually helped contribute to the historically high annual inflation rates in 2021. On the other hand, the shortage of supply, mostly resulting from the discontinued production across the global supply chain, posed further threats to the maintenance of a low and stable inflation rate.
Keywords: COVID-19, Money, Supply

1. THE INCREASE IN THE MONEY SUPPLY DURING THE COVID-19 OUTBREAK

In response to the COVID-19 crisis, the Federal Reserve injected large amounts of liquidity into the market. The growing price level caused by a major increase in the money supply corresponds to Milton Friedman's argument that inflation is produced by an increase in the money supply. Shortly after the outbreak of the coronavirus pandemic, the Federal Reserve adopted a loose monetary policy to stimulate the economy. At its meetings on March 3 and March 15, 2020, the Fed cut its target for the federal funds rate by a total of 1.5 percentage points. The Fed also resumed purchasing massive amounts of Treasury securities and government-guaranteed mortgage-backed securities, releasing liquidity to the market, and encouraged banks to lend by lowing the rate it charges banks for loans. The rapid growth in savings is reflected in a sharp increase in the M1 money supply, which promotes the willingness to pay for consumers and the willingness to invest for businesses. After the outbreak of coronavirus, the year-on-year growth rate of M2 in the U.S. has increased rapidly from 7% to 26%. Although the value of M2 is still lower than the growth rate of M0 in the same period, it is still the highest growth rate since the start of data collection in 1960, and double the growth rate in the 1970s. The inflationary pressure caused by the pandemic emergency procurement plan is relatively evident. In addition to the increase in the money supply, it is also worth noting that the velocity of money circulation and supply shortage contribute to the current inflationary pressure globally.

2. THE VELOCITY OF THE MONEY CIRCULATION BEFORE AND DURING THE COVID-19 OUTBREAK

This essay applies the Quantity Theory of Money to analyze the role of the velocity of money circulation in the current inflationary environment. In monetary economics, the Quantity Theory of Money indicates the relationship between price level, money supply, the economic output, and the velocity of money circulation. The Theory is written as $MV = PY$, where M represents the money supply, V is the velocity of the circulation of money, that is, the average number of transactions that a unit of money performs within a specified interval of time, P is the price level, which is commonly measured by the CPI, and Y refers to the real gross domestic product. Based on the equation, any increase in M must increase P if V and Y are held constant (Henderson, 2021). In particular, the value of V is commonly derived from the other three variables in the equation. According to the Quantity Theory of Money, an increase in the gross demand for goods and services attributed to the growing money supply should naturally induce a higher price level for an economy in the short run. Nevertheless, the decrease in velocity of the circulation of money during the COVID-19 outbreak in 2020 relieved the inflationary pressure in the short term to a certain extent as the monetary easing policies were initially adopted in many countries. Historically, the velocity of money circulation in the U.S. fluctuated around 1.8 from 1960 to 1990, increased to 2.2 in the last decade of the 20th century, then decreased into a fluctuating downward trajectory and fell to 1.1 in the wake of the coronavirus pandemic. Before 2020, the increase in the money supply in the U.S., when quantitative easing was in effect, was partially offset by a gradual decline in the velocity of money circulation, and the level of inflation has been mostly kept below 3%. After the outbreak of COVID-19, governmental regulations including maintaining social distance and implementing curfews were widely adopted across the U.S. and Europe. The social regulations have decreased the level of consumer spending and investments, and correspondingly slowed down the velocity of money circulation. Consequently, the increases in the money supply should lead to an immediate increase in the price level, but the significant decrease in the velocity of the circulation of money again offsets the inflationary effect in the short run. The annual inflation rate of the U.S. measured by CPI data remained a low of 1.2% in 2020 across the U.S.

3. THE VELOCITY OF THE MONEY CIRCULATION AND SUPPLY SHORTAGE IN THE POST-COVID-19 ERA

Since early 2021, the velocity of money circulation has gradually recovered as consumers and some businesses began to adapt, whereas businesses that depended on the global supply chain were generally still negatively affected by the pandemic due to the lasting supply shortage of materials, manufacturing, and consumer goods. The combined factors of the growing velocity of money circulation and the continuous supply shortage altogether contribute to the soaring inflation. When most governments no longer impose COVID restrictions, consumers tend to spend more money than during the pandemic. The spike in the savings rate across the U.S. and Western Europe as a result of stimulus payments and spending restrictions also left most households in a strong position to spend. A higher level of consumption pushed up the cost of goods on the demand side. On the supply side, however, the global supply chain has gone through serious challenges as factories worldwide discontinued production activities or produced fewer units of products, which lead to inefficiencies and higher costs for businesses, and the process of shifting to other suppliers is time-consuming and more costly in most cases. Companies have to pay more or wait longer for obtaining the equivalent materials, components, equipment, labor, etc before the pandemic. Monetary policies are fairly useless on the supply side, and the higher costs of businesses will eventually translate to higher prices of commodities, inducing a spiral effect.

4. CONCLUSION

In general, during the first wave of COVID-19, restrictions dampened the speed of money in circulation, which partially offset the inflationary effects of expansionary monetary policy in 2020. With the gradual relief of epidemic prevention and control, the U.S. economy continued to recover. The level of production and consumption consistently returned to pre-COVID levels, and the velocity of money circulation also moderately recovered. The Federal Reserve has not reduced the growth of the money supply to an appropriate level. Broad money M2 still maintains a double-digit growth rate. Eventually, the quantitative easing policies, when combined with multiple exogenous factors including the change in the velocity of money circulation and the shortage in global supply caused by COVID-19, and the Ukraine conflict adding pressure on prices of energy and food, led to astronomically high inflation rates in the U.S., European countries and many other countries. To conclude, the argument of Friedman in the 1960s could still give us some insights into understanding the current inflationary pressures. Meanwhile, it is essential to point out that inflation can also be triggered by significant changes in the level of the velocity of money circulation. The era of the Coronavirus pandemic is an important example for economists, and remarkable changes in the velocity of the circulation of money may also occur during periods of wars and political or financial instability. Continuous monitoring and speculations on the velocity of money circulation, which can be interpreted by the level of economic and social activities, is crucial for monetary policymakers to assess both the short-term and long-term influence of potential monetary policies. Additionally, short of supply in the global spectrum triggered by COVID-19 is another factor that promotes the growth of inflation. Establishing a healthy and stable supply chain for core industries is of significance for any country to remain financially stable during a crisis. The optimization of the supply chain can be partly achieved in the long run by setting up multiple suppliers for key components both globally and domestically, and maintaining mutually beneficial relationships with major trade partners across the globe.

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INFLATION-TARGETING POLICY AS A FACTOR IN ECONOMIC GROWTH SLOWDOWN IN DEVELOPING COUNTRIES: CASE OF ARMENIA

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ABSTRACT

The key objective of this study is to assess the impact of inflation targeting policies on economic growth rates in the long term in developing countries using the example of Armenia. Our research proves that most of the regulatory mechanisms in an emerging economy that determine the policy of inflation targeting have a negative impact on economic activity and lead to a slowdown in economic growth in the long term. At the heart of the debate about the best approaches to monetary policy is the question of whether this policy should be focused only on ensuring macroeconomic stability through inflation targeting, or whether the problem of ensuring sustainable economic growth should also be included in the scope of the central bank's tasks. Our study will show that in an emerging economy, in the face of institutional failure and market distortions, all macroeconomic policy, including the central bank policy, should be aimed at ensuring sustainable economic growth. And this, in turn, determines the fact that the problem of monetary regulation is most acute in developing economies. The paper considers the key mechanisms of the impact of monetary policy on economic growth in Armenia in order to assess the positive or negative aspects of the impact of inflation targeting on the economy. Our study will prove that policies to maintain macroeconomic stability, which include inflation targeting, have a negative impact on economic growth in an emerging economy. The analysis carried out in the work will show significant distortions and inefficiency of monetary regulation in Armenia, which affects both inflationary processes and the country's economic growth rates.
Keywords: monetary policy, inflation targeting, monetary policy, economic growth, developing countries

1. INTRODUCTION

It is known that in order to achieve sustainable economic growth, many countries are looking for the most optimal ways to implement macroeconomic policies. Thus, among the most popular approaches, one should single out the thesis based on the policy of maintaining macroeconomic stability. However, the experience of recent decades has shown that such a policy in relation to developing countries does not always lead to sustainable economic growth, and even leads to negative consequences for the economy. The key goal of the study was an attempt to identify and evaluate the main policy instruments for maintaining macroeconomic stability in terms of ensuring sustainable economic growth rates. Key research objectives include the following:

- a review of fundamental approaches to theories on the policy of maintaining macroeconomic stability in the economy on the example of inflation targeting policy;
- identification of key instruments for inflation targeting in the context of the policy of maintaining macroeconomic stability;
- analysis and evaluation of inflation targeting policy in practice and its impact on economic growth rates, on the example of Armenia.

The idea of a macroeconomic stability policy is based on the thesis that by maintaining stability in the macroeconomic environment by maintaining key indicators at a certain level, economic growth can be ensured in the long term. At the same time, maintaining a low level of inflation is the basis for ensuring macroeconomic stability. The problem of maintaining macroeconomic stability is discussed in the works of J.M. Keynes, A. Smith, D. Ricardo, J.B. Sey, V. Pareto, D. S. Mill, K. Marx, A. Marshall, I. Fisher and many other figures of scientific economic thought, including modernity. The totality of theories of macroeconomic stability define it as a sustainable development of the economy in the absence of crises. At the same time, as mentioned above, stability means the preservation or maintenance of key macroeconomic indicators at the same level. Thus, the entire macroeconomic policy is reduced to maintaining these indicators both in the short term and in the long term.

2. LITERATURE REVEW

The idea of applying a contractionary monetary policy in the context of growth is based on the thesis about the negative impact of inflationary pressure on economic growth. According to Friedman, monetary policy can and should ensure that the money itself does not have a negative impact on the country's economy [Friedman M. (1968)]. In other words, the equilibrium price level is the guarantor of macroeconomic stability, and this task should be the key one for the monetary authorities. Hence, at the heart of the theory of maintaining macroeconomic stability is the provision of a stable inflationary background by the monetary authorities. In the expert community, the impact of monetary regulation on economic growth is rather contradictory in terms of maintaining a stable and low price level. The opinions are opposite: from the thesis that the containment of the price level in the long term causes economic growth to the thesis that such a policy leads to a recession and negative consequences for economic growth. Among the arguments in favor of the first thesis, it is noted that inflation in itself is not a factor of macroeconomic destabilization, but it can be considered as such and pose a threat to economic growth [Corden M. (1990)] in conditions of high prices or their volatility. A number of authors [Levine R., Zervos S. (1993)] note that a stable price level determines economic growth, as a creator of an appropriate stable macroeconomic environment. Other authors express the thesis that with the help of monetary policy instruments aimed at reducing the price level in the country, the monetary authorities have the opportunity to stimulate economic growth [Annicchiarico B., Rossi L. (2012)]. Hove, S., Tchana, F.T., Mama, A.T. (2017) notes that if monetary policy succeeds in ensuring equality between the inflation expectations of economic agents and real inflation, then this policy is likely to have no effect on investment decisions, which in turn ensures sustainable economic growth in the long term. At the same time, monetary policy cannot influence the potential level of gross output. Therefore, depending on whether the economy is operating above or below potential, a choice can be made between expansionary and contractionary monetary policy. At the same time, recent economic studies [Coats, W. (2000)] have shown that indicators of long-term economic growth correlate weakly with changes in inflation indicators. More important is the impact of predictable and unpredictable inflation on economic development. Empirical evidence according to Barro [Barro R. (1995)] shows that high levels of inflation are associated with volatile and therefore less predictable inflation. Friedman [Fridmen M., Shwarc A. (1963)] also notes that economic growth is achievable both with rising and falling prices, provided that their expected growth is moderate and predictable. On the other hand, there is an opinion [Bencivenga, Valerie R., and Bruce D. Smith, 1991] that in the long run inflation has a negative effect, while in the medium and short run inflation has a contradictory effect on economic growth. During periods of temporarily high inflation, economic growth slows down. However, then, after the stabilization of the price level, the rate of economic growth, in turn, returns to normal.

Bruno and Easterly [Bruno M., Easterly W. (1998)], in their study on the impact of the inflationary background on economic growth, note that in most cases, economic growth during the inflationary crisis was higher than the world average for this period and lower compared to the same figure before the crisis. At the same time, the costs of inflation - relative price volatility, uncertainty, reduction in reliable information about prices, worsening credit conditions - become significant only at relatively high levels of inflation. With lower inflation, inflation growth may be affected by various supply and demand shocks and not show a clear interdependence. In addition, Bruno and Easterly showed that there is an increase in the rate of economic growth with a decrease in the level of inflation, if its level exceeds 40%; in other cases, there is no definite correlation between the increase in economic growth rates and the level of inflation. Other authors agree with this [Stiglitz, J.E. (2003)], noting that at the moment it is difficult to draw definite conclusions about the positive or negative impact of relatively low and stable inflation rates on economic growth. Sachs [Sachs, J. (1996)] notes that while there is agreement that no economy can perform well with hyperinflation, there is no consensus on the benefits of lower inflation. There is no evidence that lowering inflation more and more brings benefits equal to the costs, and some economists even believe that pushing inflation too low has negative consequences. James and Keating point out that an increase in the rate of money growth in an economy with an inherently low rate of money creation leads to an increase in long-run real growth. But a persistent increase in the rate of money growth in an economy with an initially high rate of money growth has negative consequences for long-term real growth [Bullard, James, and John Keating, 1995]. According to Fischer [Fischer S. (1993)], the negative relationship between inflation and economic growth is expressed in a reduction in investment and a decrease in productivity growth. De Gregorio [De Gregorio J. (1993)] adds to these negative factors an increase in the cost of labor, which leads to a reduction in employment and a reduction in GDP. By and large, the above arguments underlie the commitment of modern central banks to contractionary monetary policy for at least the past 30 years. Evidence of the popularity of the policy of maintaining a stable price level is the dynamics of the number of countries implementing inflation targeting policies (see Chart 1) and the position of the IMF on this issue. On the other hand, the thesis that price containment can have a negative impact on economic growth in the long run is also presented with significant arguments.
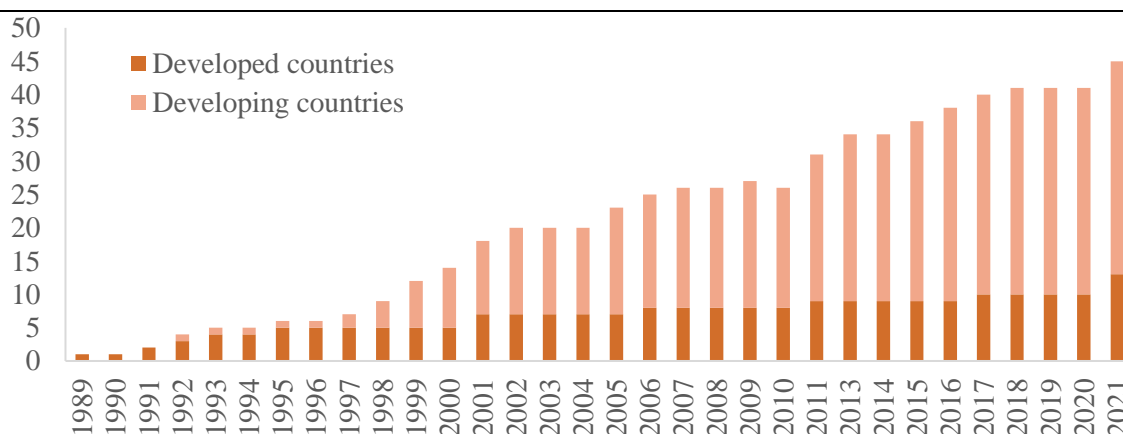
Chart 1: Inflation Targeting Countries
(Source: International Monetary Fund, Annual Report on Exchange Arrangements and Exchange Restriction, 2022. – www.imf.org)

Despite the fact that inflation targeting has undeniable advantages for developed economies, their implementation in emerging markets can lead to certain negative consequences in terms of economic growth.

So Cecchetti and Ehrman [Cecchetti S., Ehrmann M. (2002)], examining the consequences of the implementation of the inflation targeting policy on economic growth in the country, came to the conclusion that during periods of supply shocks, monetary policy could maintain within long-term target levels either inflation, or economic growth rates. The results of research by a number of scientists [Mishkin, F.S. (2004)] led to the general conclusion that the inflation targeting policy helped reduce the volatility of economic growth rates, that is, smoothed out fluctuations in the indicator. However, none of the studies revealed a noticeable influence of monetary policy on the GDP growth rates themselves. Svensson L.E. (2010), on the contrary, notes the positive impact of the introduction of inflation targeting on economic growth rates. The analysis also showed that the impact of the inflation targeting policy on the pace and volatility of economic growth is ambiguous. Depending on the research method, the selected time period and the sample of countries studied, the conclusions regarding the role of monetary policy in economic development may be opposite. However, it can be argued that maintaining a stable price level to the detriment of other macroeconomic policy goals (for example, reducing unemployment) in a developing economy invariably leads to a recession in the long run. Reynard's (2007) study showed that the introduction of inflation targeting in emerging economies, given the weak institutional framework for monetary policy, can lead to even larger imbalances in aggregate output than can be seen in advanced economies. Van der Merwe, E.J. (2004) in his work points out the methodological problems of setting core and actual inflation as a target. Thus, summarizing, the approach to macroeconomic regulation within the framework of maintaining price level stability raises quite a few questions from the point of view of ensuring sustainable economic growth rates, especially when it comes to developing countries.

3. INFLATION TARGETING IN ARMENIA

Like many emerging economies, Armenia is in dire need of an effective monetary policy. At the initial stage, in the 1990s, in the conditions of a strong economic downturn, the monetary authorities implemented monetary aggregate targeting policies, and only in 2006 did Armenia switch to inflation targeting. Figure 1 reflects the key principles of the implementation of the monetary policy of the Central Bank of the Republic of Armenia within the framework of the inflation targeting regime. In particular, the first set of principles includes institutional factors that meet the necessary conditions for implementing the inflation targeting policy.
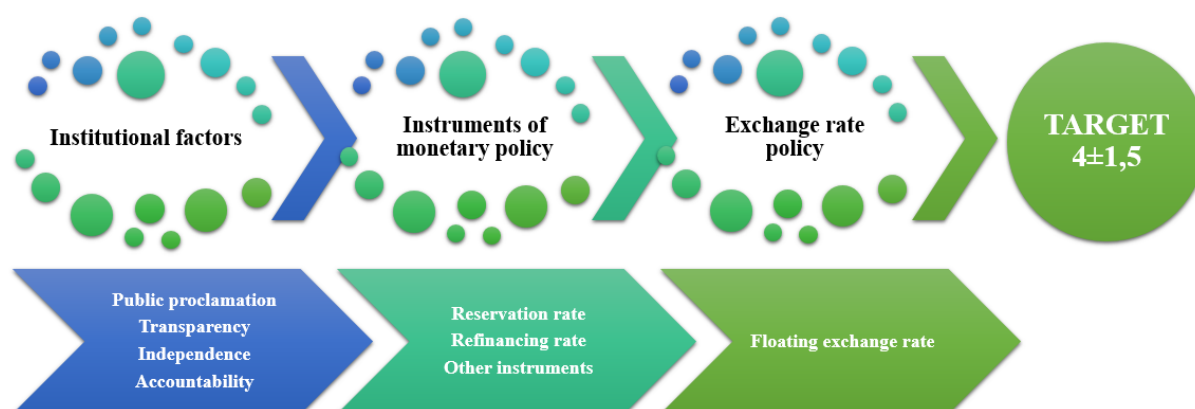
Figure 1: Inflation targeting in Armenia

The target of Armenia's monetary policy is to ensure a stable price level, as well as ensuring financial stability. The nominal anchor of monetary regulation is set at the core inflation rate of 4%, taking into account the corridor of 1.5%.

As for monetary policy instruments, in general, due to the not well-developed financial system, the Central Bank of the Republic of Armenia has a rather limited range of monetary mechanisms for influencing targets. In particular, the Central Bank of Armenia relies on the reserve ratio, the refinancing rate, as well as on some other instruments. Currency regulation, according to the IMF classification, is implemented within the framework of the "Regulated floating" regime. Assessing the effectiveness of inflation targeting in terms of achieving the nominal anchor of monetary policy, one can conclude that the implementation of the regime has been rather inefficient since its introduction (see Chart 2). In half of the cases, the "monetary authorities" failed to achieve the established targets.
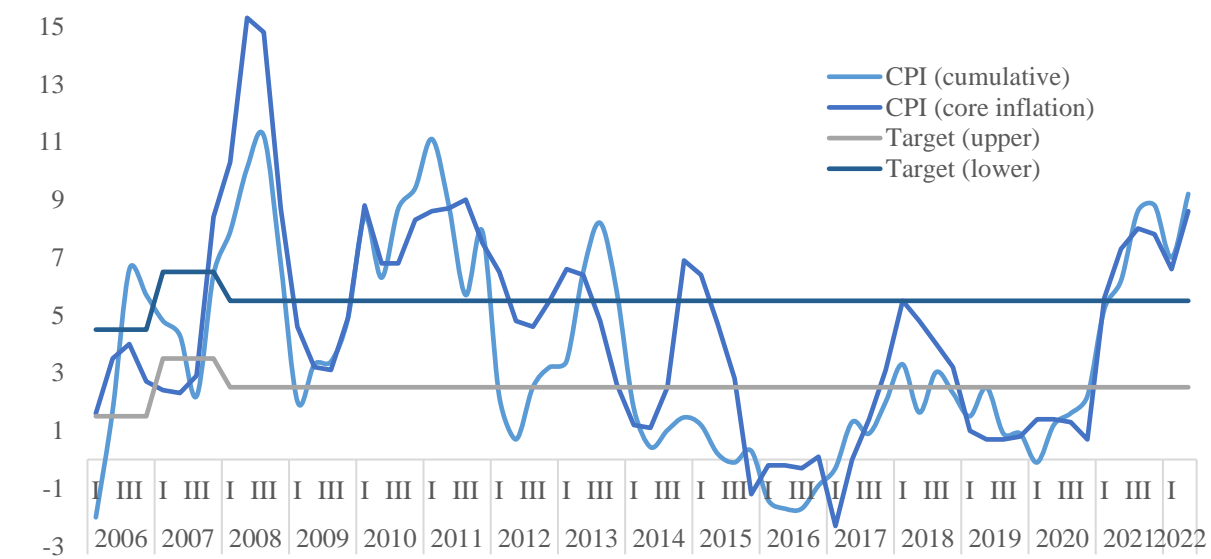
Figure 2: Inflation and the Nominal Anchor of Inflation Targeting in Armenia
(Source: Database CB of Armenia – www.cba.am)

At the same time, when analyzing monetary policy from the point of view of the use of key instruments, it is their procyclical nature that should be noted. So, if we talk about interest-bearing instruments in general, and about the reserve ratio in particular, almost throughout the entire period under review, the Central Bank of Armenia pursued a contractionary policy, despite the three crises that we are witnessing at this time (see Chart 3).
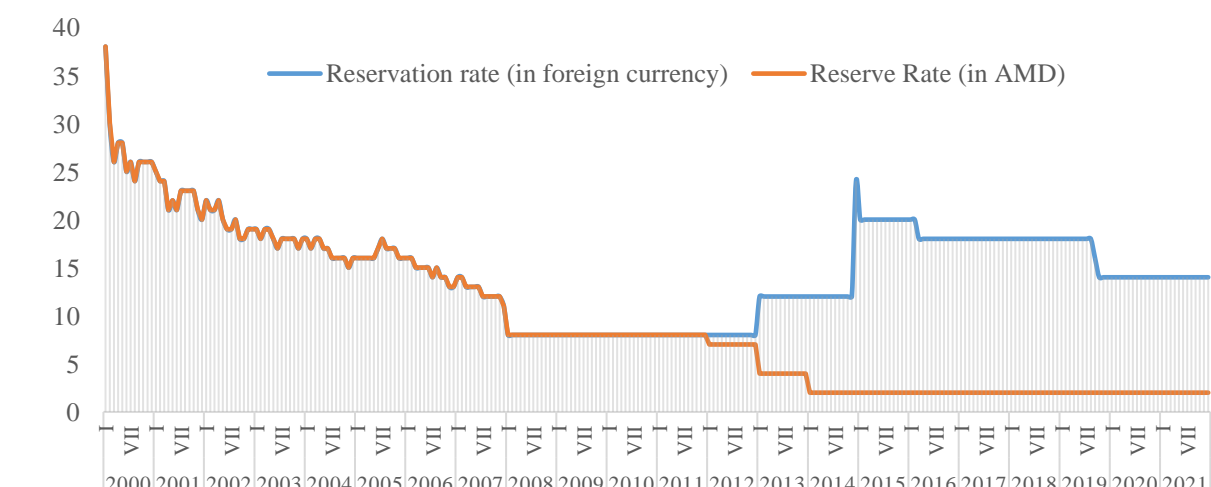
Figure 3: Reservation rate of the Central Bank of the Republic of Armenia
(Source: Database CB of Armenia – www.cba.am)

In other words, the priority in achieving stable and low inflation rates forces the monetary authorities to pursue a contractionary policy even in times of crisis, which threatens economic growth and exacerbates the stagnation in which the economy is located. Our research [Sandoyan E.M., Voskanyan M.A., Galstyan A.G. (2022)] prove that even in a crisis, the central bank does not pursue a countercyclical policy, but focuses on maintaining the price level, weeks on stimulating economic growth. On the other hand, the same priorities are forcing the monetary authorities to pursue a fairly tough policy regarding currency regulation. Thus, over the past fourteen years, the Central Bank of Armenia has been conducting rather strict regulation of the exchange rate of the national currency in order to contain inflationary pressure in the economy (see Chart 4). This policy resulted in three currency crises experienced by the Armenian economy since 2009. The most stringent currency regulation is observed in the period in 2014-2020, which undoubtedly had a negative impact on economic growth rates in this and subsequent periods. At the same time, the analysis of the dynamics of the dram exchange rate proves the pro-cyclical nature of the monetary policy, since in all periods of crises we observe a tough, restraining policy on the part of the Central Bank of Armenia.
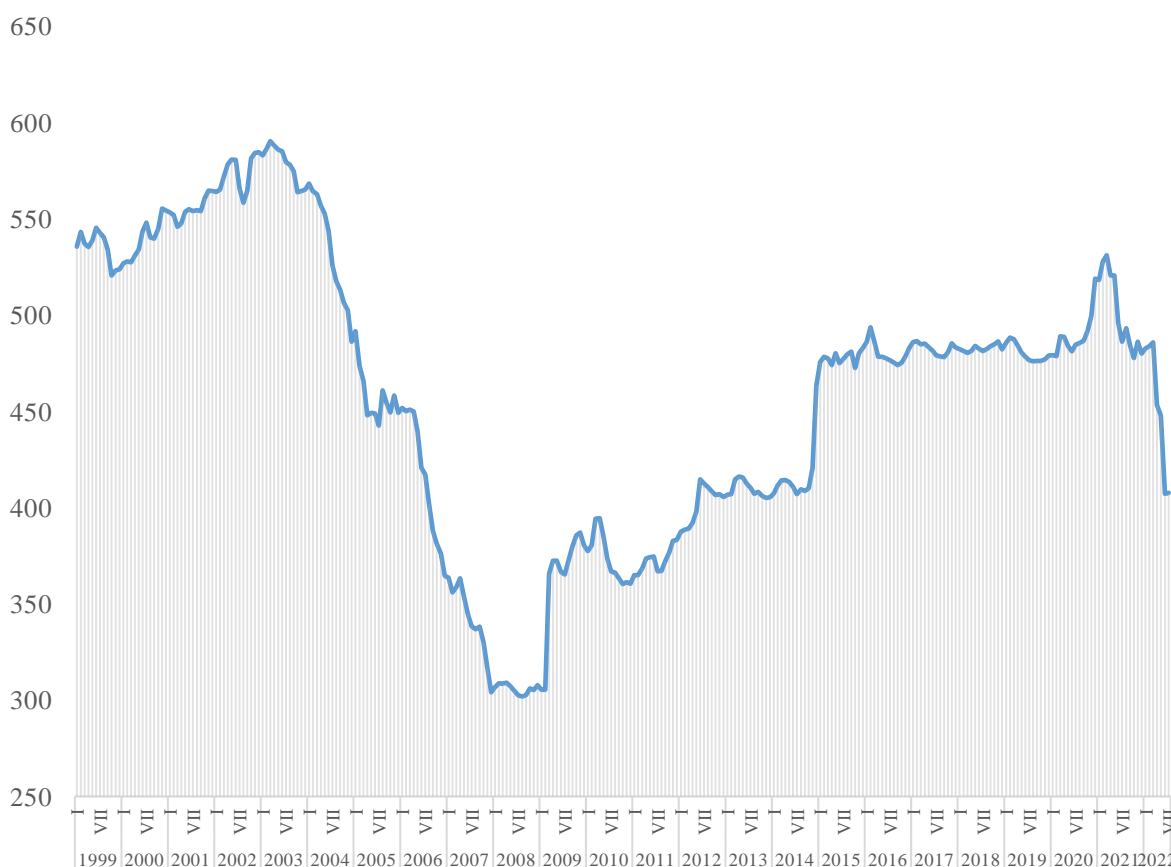
Figure 4: Dynamics of the USD/AMD exchange rate in Armenia (monthly)
(Source: Database CB of Armenia – www.cba.am)

Our research [Sandoyan E., Voskanyan M., Galstyan A. (2018); Voskanyan M.A., Galstyan A.H. (2021)] repeatedly proved the active intervention of the Central Bank of the Republic of Armenia in the foreign exchange market of Armenia. The daily dynamics of the dram exchange rate also proves the active intervention in the dynamics of the exchange rate in the period 2008-2020.
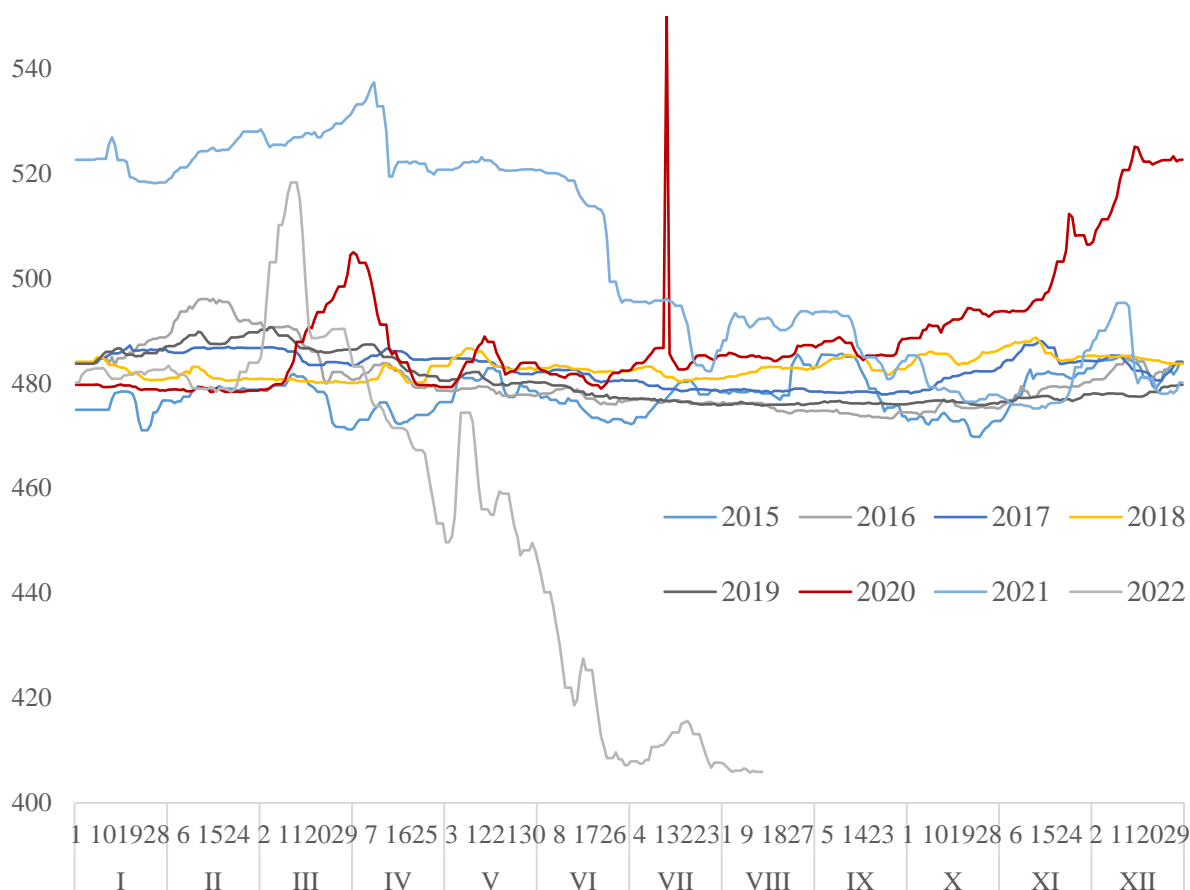
Figure 5: US dollar to AMD exchange rate, daily
(Source: Databases www.rate.am)

As can be seen in Figure 5, the average exchange rate volatility is within 5%, including periods of political instability, as well as military actions, which should have led to instability in the foreign exchange market. Thus, given the rather stable dynamics of the dram exchange rate, it can be argued that the regulation by the "monetary authorities" was significant. Thus, monetary policy, both in terms of inflation targeting and foreign exchange regulation, leads to negative consequences for economic growth, especially in the long term.

4. IMPACT ON ECONOMIC GROWTH

As for the impact of monetary policy on economic growth rates in Armenia, it should be noted that over the past 10-14 years, the economy has been experiencing a slowdown in economic growth rates, which is associated with three crises during this period, as well as inefficient macroeconomic policy in general (see chart). 6). In our opinion, monetary policy plays a key role in this. An analysis of the policy of the "monetary authorities" over the past 15 years proves that in an attempt to maintain macroeconomic stability, the Central Bank has constantly pursued a contractionary policy, despite crises and stagnation in the economy. This policy was driven by inflation targeting and its key conditions, when the priority is to achieve a stable price level and all other goals are secondary. However, as we could see above, the targets were not achieved in half of the cases. At the same time, attempts to contain the rise in prices led to a containment of economic growth in the long term.
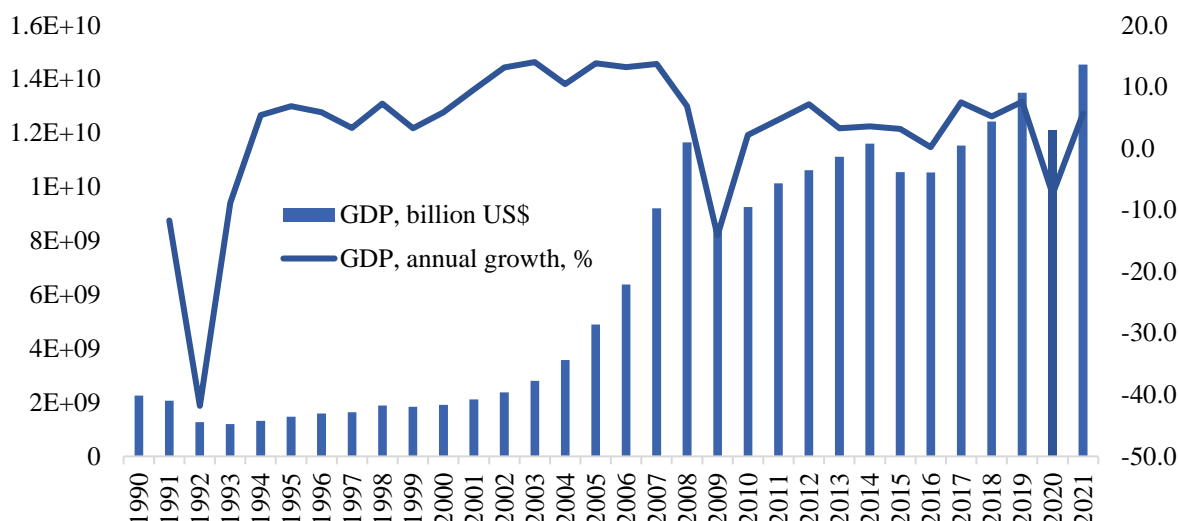
Figure 6: GDP and economic growth rates in Armenia.
(Source: World Bank Database - – https://databank.worldbank.org/)

Figure 7 illustrates the key channels of influence of the monetary and foreign exchange policy of the Central Bank of the Republic of Armenia on aggregate demand.
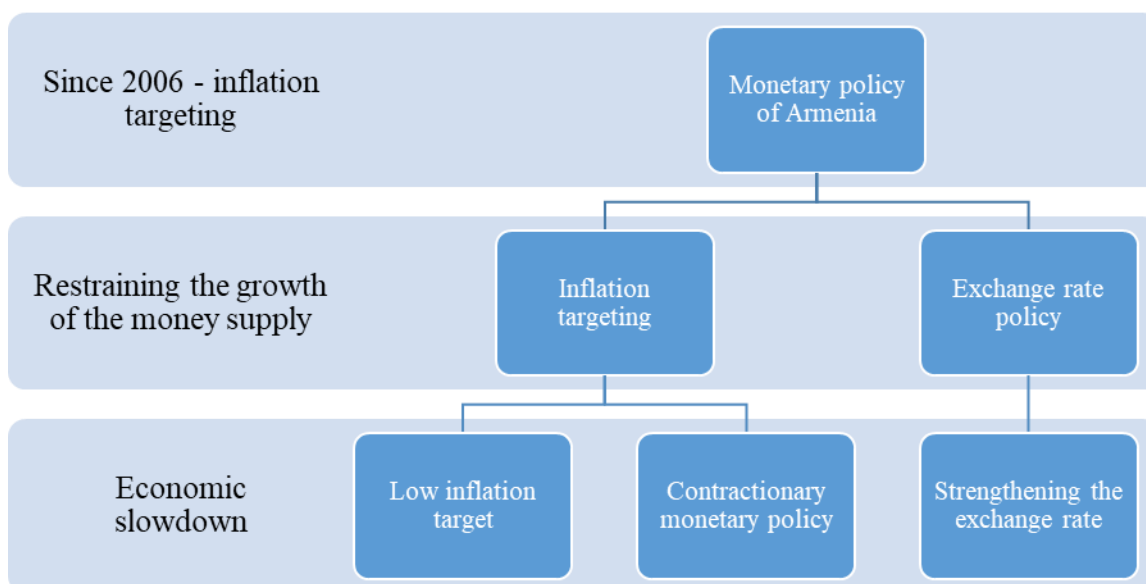
Figure 7: The role of monetary and foreign exchange policy in the economic growth of Armenia

The terms of the inflation targeting regime imply the maintenance of a stable price level, which provides for low inflation rates. As a result, the monetary authorities of Armenia, as shown above, are pursuing a tight monetary policy, which ultimately leads to curbing the growth of the money supply, and as a result, a reduction in aggregate demand. In terms of currency regulation, again, the priority of achieving stable and low inflation rates forces the exchange rate to be maintained at a certain level, which ultimately leads to a reduction in exports, as well as in the volume of private money transfers in dram equivalent, which ultimately leads to a reduction in both aggregate supply, as well as aggregate demand.

5. CONCLUSION

Summarizing the above, we can single out the thesis about the need to revise approaches to macroeconomic regulation in developing countries. Monetary policy within the framework of inflation targeting is rather negative for countries with emerging or developing markets, which has been proven by many studies, and in particular, by the example of Armenia over the past sixteen years. The priority of inflation does not allow stimulating the economy either through monetary regulation or through fiscal policy mechanisms. And if in a developed economy the issue of stimulating economic growth is not relevant, then for emerging markets this goal should be an absolute priority.

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STATISTICAL ANALYSIS OF THE BULGARIAN BEEKEEPING MARKETS

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ABSTRACT
The hypothesis for a balance between the markets of bee products of factors and means of production in the Bulgarian beekeeping determines the need to study the relationships between them through statistical analysis, which is the purpose of the study. The urgency of the issue of statistical dependence between them is determined by the markets they generate in a number of agricultural sectors, industries and services, which create opportunities for employment, income, sustainable development and competitiveness. As the official agro statistics do not give an accurate idea of the state and dynamics of the sectoral markets (production, factor and means of production), on the basis of conducted surveys and additional ones for their size and dynamics for the period 2010-2020, a base has been formed to analyze the statistical relationship between them. Correlation analysis shows a very high correlation between the markets for means of production and factor markets. A high correlation has been established between the factor markets with the markets for bee products and the markets for means of production with the markets for bee products. The study found that the correlation coefficients were statistically significant, i.e. there are significant correlations between the studied features, which is the basis for the construction of linear one-factor regression models, as the individual regression dependencies can be combined into a common theoretical model presented by equation. This model is used to calculate the theoretical dimensions of the studied markets. This allows precise and long-term planning of the development of Bulgarian beekeeping, its target markets, the necessary innovations, investments and development prospects.
Keywords: product markets, factor markets, means of production markets, statistical analysis

1. INTRODUCTION
The national markets for bee products have a significant impact on the state and potential for development of Bulgarian beekeeping. They determine the quantity, quality and type of bee products produced, as well as the markets of factors (land, labor, capital) and means of production - hives, frames and wax bases, preparations and feed, means of processing and others. The revenues, expenses and expected incomes of the Bulgarian beekeeping depend on these markets. Based on them, quantity, quality, technologies, revenues, costs, incomes, investments and etc., are planned, which is why they are one of the engines for the development of the national beekeeping. This makes the study of the statistical relationship between them extremely important and relevant. The urgency of the problem of studying the statistical relationship between these beekeeping markets is due to their important role in ensuring healthy and climate-neutral bee products, food security from pollination, as well as the markets they generate in a number of agricultural sectors (fruits, vegetables), industries (pharmacy, food) and services (tourism, api-therapy) that create employment, income and sustainable development. Markets can have both positive and negative impact on the development of Bulgarian beekeeping, according to the opportunities for access to them, the provided income and other non-financial motivating factors, which makes the study of the statistical relationship

between them extremely important. The question of the statistical dependence between the markets of products, factors and means of production in the Bulgarian beekeeping is supplemented by the existence of global threats and opportunities, the adaptation to which requires such a study. Providing competitive bee products for access to international and regional markets requires forecasting the development of factor markets and means of production. The survival, prosperity and achievement of supranational competitiveness of the Bulgarian beekeeping depends on the markets of bee products, factors and means of production. Beekeeping is part of the promising green circular bio-economy, the development of which also depends on these markets and the relationships between them. Current research on the markets of Bulgarian beekeeping determines sizes, but not relationships between them. The organizational (B2B) markets for honey are estimated at over 54 BGN million/year, and the consumer (B2C) markets at over 44 BGN million/year. B2B the markets for wax, pollen, propolis and royal jelly are estimated at over 6 BGN million per year, and the means of production from the sector (queen bees and pollination) at over BGN 3.4 million/year, i.e. 10 BGN million/year or about 10% of those of honey (Lyubenov, 2020). The markets of factors (land, labor and capital) in the Bulgarian beekeeping are estimated at 99 BGN million/year (Lyubenov. Lyubenova. Hristakov, 2021), and on means of production (preparations, fodder, frames, beehives, inventory and machines) for over 50 BGN million/year (Lyubenov. Atanasov. Hristakov, 2021). Bulgaria is in the top 12-15 of honey exporters in the world, producing about 15 thousand tons of honey per year, although official statistics report more than 5 thousand tons less (Lyubenov, 2019). This shows the presence of a gray sector in Bulgarian beekeeping, which amounts to over 5 thousand tons of honey, which makes up 1/3 of the total amount, and wax, pollen, propolis and royal jelly occupy about 10% of it. The gray sector of honey based on B2B markets amounts to 33 BGN million/year, and of bee products outside its category 10% of it, i.e. 3.3 BGN million/year. It is necessary to take into account the gray sector of the B2C markets, where prices are twice as high as those of the B2B markets, as well as in the biological segment, where prices are even higher. Research on the markets of Bulgarian beekeeping in the last decade concerns not only the determination of their size (Lyubenov, 2019; Lyubenov, 2020; Lyubenov. Lyubenova. Hristakov, 2021; Lyubenov. Lyubenova. Hristakov, 2021; Lyubenov. Atanasov. Hristakov, 2021), but also raising a hypothesis for balance and comparability between the markets of bee products and the markets of factors and means of production, as the economic effect of pollination has been identified as an important indicator regarding forecasting their potential (Lyubenov, 2017). The verification of this hypothesis forms the purpose of the present study - analysis of the statistical dependence between the markets of products, factors and means of production in the Bulgarian beekeeping.

2. MATERIAL AND METHODS
The research dedicated to the analysed problem is insignificant, and its importance for accelerated and sustainable development of the national and regional beekeeping is great, therefore its coverage will improve the development of the sector. The need for the study stems from its great relevance. Statistical information was used, as well as that from other sources and own calculations. The information from the different sources is compared and subjected to critical analysis regarding the dynamics of the studied markets for the period 2010 - 2020, to form a solid basis for analysis of the statistical dependence between them. The research is based on the complex combination of methods of analysis, synthesis, grouping, concretization and mainly of mathematical and statistical methods.

3. RESULTS AND DISCUSSION
The dynamics of the Bulgarian markets of bee products, markets of factors and means of production in the period 2010-2020 has been studied. A mathematical analysis of the statistical

dependence between these markets has been performed. The hypothesis for statistical interrelation between the analysed markets of the Bulgarian beekeeping (markets of bee products, markets of factors and markets of means of production) is confirmed.

3.1. Sector Market Research

The study of the dynamics of the markets of the Bulgarian beekeeping for the period 2010-2020 covers the production markets of bee products (honey and products outside its category), the markets of factors and the markets of means of production. The official agro statistics do not give an accurate idea of the state and dynamics of the production markets in beekeeping - Table 1 (Agrarian Reports, 2011-2019). It reports lower quantities and prices, which change slightly for the analysed period, which contradicts the volatility characteristic of agricultural production and agricultural markets. The number of farms has more than doubled in 10 years, the hives have increased almost as much, the average yield has not changed significantly, and the yields remain relatively constant, which contradicts the production and economic logic. The statistics do not take into account the organic sector, which exceeds 33% in 2018, as well as retail markets (B2C), where prices are traditionally about twice as high as wholesale markets (B2B).

Years	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Beehives, thousand	613	548	529	542	588	748	754	766	783	867	999
Farms, thousand	27,5	21,9	19,3	17,2	16,1	17,9	18	13,4	12,3	13,8	12,2
Yield, kg/hive	19	20	19,6	21,1	18,1	19,2	20	19,9	16,8	16,4	17,5
Honey, thousand tons	10,6	9,6	9,2	10,1	9,3	11,4	10,2	11,8	10,4	11,5	10
Prices B2B, BGN/kg	4,8	5,2	4,9	5,2	4,9	5,4	5	5	4,9	4,2	5

Table 1: Bulgarian beekeeping in the period 2010-2020

The shortcomings of official agro statistics require the definition of production markets in the beekeeping sector based on the dynamics of the number of hives and average yield, taking into account the organic sector and retail. In addition, the presence of a significant gray sector, which occupies about 1/3 of these markets (Lyubenov, 2019), as well as the dynamics of market prices of organic and conventional honey for the period 2010-2020 should be taken into account (Lyubenov. Atanasov. Hristakov, 2021). Due to the lack of data on the online markets for organic bee products in Bulgaria, which are developing after 2015 and only as B2C, they will be considered as B2C. As in organic beekeeping it is not allowed to feed bees with honey, and in conventional sugar it is a cheaper alternative, stocks on farms are considered to be commodity. Based on the projected values for the number of hives and the average yield of hives for 2020 (Table 1) with 75% share of conventional beekeeping and 1/3 of B2C markets given the commodity nature of stocks, the markets of conventional and organic honey are determined conventional and organic bee products outside its category, as 10% of those of honey at market prices. The gray sector of conventional and organic honey and conventional and organic bee products outside its category are defined on the basis of a relative share of 33%. The national B2B markets for bee products are 61.3 BGN million/year, and the B2C markets are 53.1 BGN million/year, i.e. a total of 114.4 BGN million/year. The gray sector of the national B2B markets for bee products is 20.2 BGN million/year, and of B2C is 17.5 BGN million/year, or a total of 37.7 BGN million/year, which makes a total of 152.1 BGN million/year - Table 2. For other years see Appendix 1. Product markets.

Markets	B2B				B2C			
Bee products	Quantities, thousand tons	Prices, BGN/ton	Markets, Million BGN/year	Grey sector, million	Quantities, thousand tons	Prices, BGN/ton	Markets, million BGN/year	Grey sector, million
Conventional honey	8,7	4500	39,4	13,0	4,4	7600	33,2	11,0
Conventional products outside of honey	-	-	3,9	1,3	-	-	3,3	1,1
Organic honey	2,9	5600	16,3	5,4	1,5	10300	15,0	5,0
Biological products outside the honey category	-	-	1,6	0,5	-	-	1,5	0,5
∑			61,3	20,2	∑		53,1	17,5

Table 2: National markets for bee products for 2020

To determine the size of the production markets of bee products in the national beekeeping by years for the period 2010-2020, was used Table 2, which sets the values for 2020 (Lyubenov, 2021). According to the structure of the national beekeeping by biological and conventional sector (Agrarian Report, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, and 2019), the prices of conventional and organic honey (Lyubenov. Atanasov. Hristakov, 2021), as well as and the share of the B2B and B2C markets are determined by the sizes of the national markets for bee products for the remaining years of the analysed period - Table 3.

Years	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Production, thousand tons	11,65	10,96	10,37	11,44	10,64	14,36	15,08	15,24	13,15	14,22	17,50
Prices - B2B, BGN/ton:											
conventional honey	5,3	5,3	5,3	5,3	5,3	4,8	4,8	4,8	4,7	4,7	4,5
biological honey	7,8	7,8	7,8	7,8	7,8	7,2	7,2	7,2	6,8	6,8	5,6
Prices - B2C, BGN/ton:											
conventional honey	8,6	8,6	8,6	8,6	8,6	8,6	8,6	8,6	7,6	7,6	7,6
biological honey	11,7	11,7	11,7	11,7	11,7	11,7	11,7	11,7	10,3	10,3	10,3
Organic beehives, Thousand	46	59	85	117	107	178	236	250	264	239	250
Beekeeping: organic,%	7,50	10,77	16,07	21,59	18,20	23,80	31,30	32,64	33,72	27,57	25,00
conventionally,%	92,50	89,23	83,93	78,41	81,80	76,20	68,70	67,36	66,28	72,43	75,00
Markets, million BGN	112,5	107,3	103,7	116,8	107,3	140,6	152,	154,4	124	131	152,1

Table 3: Markets of bee products in the Bulgarian beekeeping for the period 2010-2020

To determine the size of land markets in Bulgarian beekeeping is used Table 4, in which their values for 2020 are determined (Lyubenov. Lyubenova. Hristakov, 2021). For other years see Appendix 2.1 Land markets. It is accepted that the smallest farms do not need additional land to function, and the largest ones use cheaper land because they are outside urban areas.

The study of the dynamics of land markets in Bulgarian beekeeping for the analysed period (2010 - 2020) on the basis of Table 4 covers 2010, 2012, 2014, 2016 and 2018 - Table 5.

Farms, no. beehives	Farms, no.	Farm, decare	Price, BGN/decare	Market, BGN million	Turnover, million BGN/year
from 1 to 9	2 440	-	-	-	-
from 10 to 49	5 678	0,25	3000	4,26	0,11
from 50 to 149	4 093	1,00	2000	8,19	0,20
over 150	1560	1,5	952	2,23	0,06
∑	13771			14,67	0,37

Table 4: Land markets in Bulgarian beekeeping for 2020

According to the structure of the holdings in the national beekeeping (Agrarian Report, 2011, 2013, 2015, 2017, 2019) and the average market price of the agricultural land by years (https://nsi.bg, 24.08.2021) the sizes of the land markets in sector for 2010, 2012, 2014, 2016 and 2018 - Table 5. This table also presents the dynamics of the average price of agricultural land, given its impact on the dynamics of land markets for the analysed period (2010-2020).

Years	2010	2012	2014	2016	2018	2020
Average price of agricultural land, BGN/decare	279	547	684	761	941	952
Land markets, BGN million/year	0,11	0,17	0,20	0,28	0,30	0,37

Table 5: Land markets in the Bulgarian beekeeping for the period 2010-2020.

The sizes of the labor markets in the Bulgarian beekeeping for 2020 are determined by Table 6 (Lyubenov. Lyubenova. Hristakov, 2021). For other years see Appendix 2.2 Labor markets. The study of the dynamics of labor markets in Bulgarian beekeeping for the analysed period (2010 - 2020) also covers 2010, 2012, 2014, 2016 and 2018 - Table 7.

Farms, no. beehives	Farms, no.	Labor productivity, BGN/hour	Income, BGN/month	Income, million BGN/year
from 1 to 9	2440	0,37	61	1,79
from 10 to 49	5678	1,83	305	20,78
from 50 to 149	4093	3,66	610	29,96
over 150	1560	7,32	1220	22,83
∑	13771			75,35

Table 6: Labor markets in Bulgarian beekeeping for 2020

According to the structure of the farms in the national beekeeping (Agrarian Report, 2011, 2013, 2015, 2017, 2019), the minimum wage and its doubled minimum hourly wage by years (https://kik-info.com, 24.08.2021) are determined the size of the labor markets in the sector and for 2010, 2012, 2014, 2016 and 2018 - Table 7. This table also presents the dynamics of the minimum wage, respectively the minimum hourly wage, given their impact on the dynamics of the labor markets for the analysed period 2010-2020.

Years	2010	2012	2014	2016	2018	2020
Minimum salary, BGN/month	240	290	340	420	510	610
Minimum payment, BGN/hour	1,42	1,73	2,03	2,5	3,07	3,66
Labor markets, BGN million/year	31,78	30,06	33,12	49,07	57,39	75,35

Table 7: Labor markets in the national beekeeping for the period 2010-2020

To determine the size of the financial markets in the Bulgarian beekeeping for the analysed period (2010-2020), a study (Lyubenov. Lyubenova. Hristakov, 2021) was used, which determined the trends and their average annual values for two reference periods of the Common Agricultural policy EU (2007-2013 and 2014-2020), with funding for the sector weaker in the first period. The study of the dynamics of the financial markets in the Bulgarian beekeeping for the analysed period (2010 - 2020) covers 2010, 2012, 2014, 2016, 2018 and 2020 - Table 8.

Years	2010	2012	2014	2016	2018	2020
National Beekeeping Program, BGN million	2,48	6,53	4,43	4,43	4,76	6,38
de minimis, BGN million	-	-	1,37	4,2	3,5	5
Rural Development Program, BGN million	4,1	7,3	10,7	10,7	10,7	10,7
Commercial banks, etc., BGN million	1,5	2	2,2	2,2	2,5	2,5
Own sources, BGN million	0,7	0,6	0,6	0,5	0,5	0,5
COVID 1 and others, BGN million	-	-	-	-	-	2,5
Financial markets, BGN million	8,78	16,43	19,3	22,03	21,96	27,58

Table 8: Financial markets in the Bulgarian beekeeping for the period 2010-2020

To determine the size of the markets for means of production outside the beekeeping sector for the analysed period (2010-2020), a study (Lyubenov. Atanasov. Hristakov, 2021) was used, which determined their values for 2020. According to the structure of farms in the national beekeeping (Agrarian Report, 2011, 2013, 2015, 2017, 2019), the prices of veterinary medicinal products, fodder, inventory and mechanization are determined by their amounts for 2010, 2012, 2014, 2016 and 2018 - Table 9. For more see Appendixes 3.1-3.5 Markets of means of production.

Years	2010	2012	2014	2016	2018	2020
Veterinary preparations, BGN million	4,09	3,8	4,57	7,11	8,04	10,23
Fodder, BGN million	6,66	6,29	7,59	11,7	13,2	16,88
Beehives, BGN million	5,21	4,76	5,2	7,16	7,44	10,00
Frames, wax bases, BGN million	3,76	3,79	4,29	6,28	7,18	9,08
Mechanization funds, BGN million	3,89	3,08	3,033	3,71	3,66	3,996
from 1 to 9 beehives	0,63	0,41	0,33	0,21	0,14	0,14
from 10 to 49 beehives	1,63	1,12	0,91	0,86	0,66	0,82
from 50 to 149 beehives	1,32	1,2	1,153	1,75	1,5	1,75
over 150 beehives	0,31	0,35	0,64	0,89	1,36	1,29
Total markets, BGN million	23,61	21,72	24,68	35,96	39,52	50,18

Table 9: Markets of means of production outside beekeeping for 2010-2020

3.2. Statistical analysis of the Bulgarian beekeeping markets

Table 10 presents data on the annual sizes of the national markets for bee products, their factor markets and markets for means of production. The study is for statistical dependence between the sizes of the above markets in the Republic of Bulgaria. If any, it will be represented by a mathematical model. The study should keep in mind that Bulgarian markets are not homogeneous and are influenced by both domestic factors and international markets. Table 10 lacks data on factor markets and means of production markets for some of the years studied. Taking this into account, we will divide the study into the following parts: 1) calculation of the expected value of the missing data; 2) correlation analysis of the studied data; 3) testing a hypothesis for significance of correlation coefficients; 4) mathematical modelling of the dependence between the studied markets.

Year	Bee products markets, BGN	Factor markets, BGN	Markets of means of production, BGN
2010	112 490 000	40 670 000	23 610 000
2011	107 271 062		
2012	103 650 000	46 660 000	21 720 000
2013	116 819 357		
2014	107 290 000	52 620 000	24 683 000
2015	140 619 328		
2016	152 010 000	71 380 000	35 960 000
2017	154 444 378		
2018	123 970 000	79 650 000	39 520 000
2019	131 054 547		
2020	152 110 000	103 300 000	50 186 000

Table 10: Value of the markets of bee products for the period 2010-2020
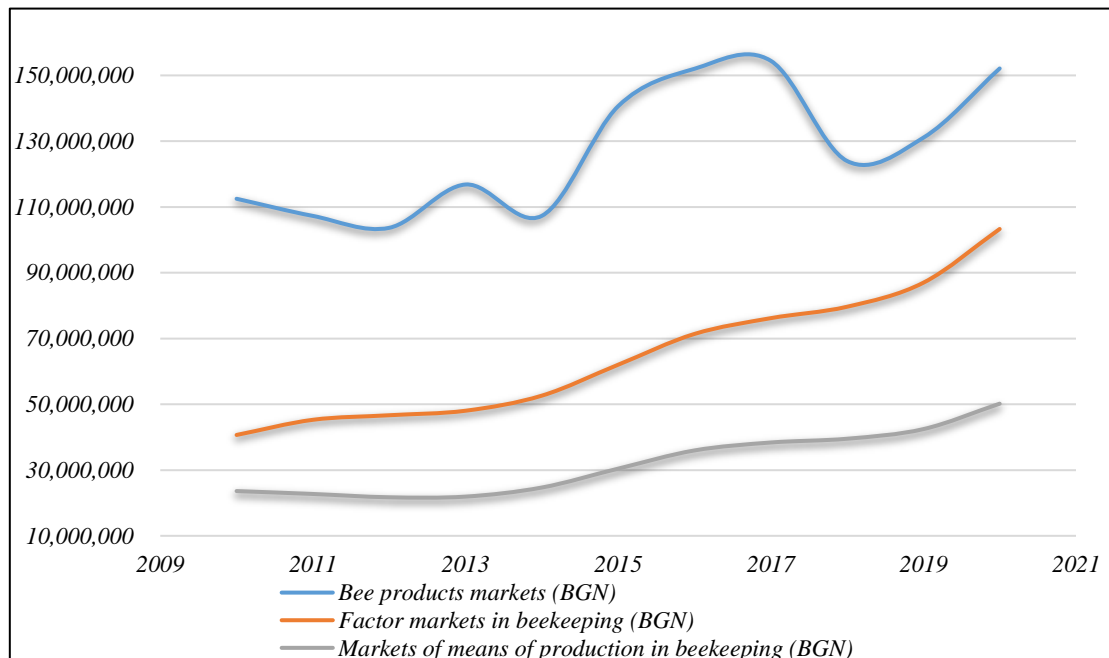
Figure 1: Dynamics of the sizes of the studied markets

To facilitate our future work, we will mark with m the studied markets as follows:
m_1 = Bee products markets
m_2 = Factor markets in beekeeping
m_3 = Markets of means of production in beekeeping

3.3. Estimation of the expected value of the missing data
Different interpolation approaches can be used to calculate the missing data, the most suitable being cubic spline interpolation (Sky McKinley and Megan Levine, 1998). Real-world numerical data is usually difficult to analyse. Any function that would effectively connect the data would be difficult to obtain and very heavy. For this purpose, the idea of cubic slaps was developed. In this process, a series of unique cubic polynomials are aligned between each numerical point, and the resulting curve is continuous and appears smooth. These cubic splines can be used to determine the rate of change and the cumulative change over an interval. The fundamental idea behind cubic spline interpolation is based on the engineer's tool used to draw smooth curves through number of points.

This spline consists of weights attached to a flat surface at the points to be connected. A flexible strip is then bent across each of these weights, resulting in a pleasingly smooth curve. The mathematical spline is similar in principle. The points, in this case, are numerical data. The weights are the coefficients on the cubic polynomials used to interpolate the data. These coefficients 'bend' the line so that it passes through each of the data points without any erratic behaviour or breaks in continuity (Sky McKinley and Megan Levine, 1998). Cubic spline interpolation is used to avoid the problem of Runge's phenomenon. This method yields an interpolating polynomial that is smoother and has less error than other interpolating polynomials such as the Lagrange polynomial and the Newton polynomial (Bartels. Beatty and Barsky, 1998; Burden. Faires and Reynolds, 1997; Press. Flannery. Teukolsky and Vetterling, 1992).

If we have a set of $k + 1$ numerical points (x_i, y_i) where no two are identical x_i and $a = x_0 < x_1 < \cdots < x_k = b$, then the spline $S(x)$ is a function satisfying:

$$S(x) \in C^2[a,b];$$

On each subinterval $[x_{i-1}, x_i]$, $S(x)$ is third degree polynomial, where $i = 1, \ldots, k$

$S(x_i) = y_i$, for every $i = 0,1, \ldots, k$.

Let us assume that:

$$S(x) = \begin{cases} C_1(x), & x_0 \le x \le x_1 \\ \quad \cdots \\ C_i(x), & x_{i-1} < x \le x_i \\ \quad \cdots \\ C_k(x), & x_{k-1} < x \le x_k \end{cases}$$

where each $C_i = a_i + b_i x + c_i x^2 + d_i x^3$ $(d_i \ne 0)$ is a cubic function, $i = 1, \ldots, k$. The essential idea is to fit a piecewise function $S(x)$. To determine this cubic spline $S(x)$, we need to determine $a_i,\ b_i,\ c_i$ for each i by:

$C_i(x_{i-1}) = y_{i-1}\ and\ C_i(x_i) = y_i,\quad i = 1, \ldots, k.$
$C_i'(x_i) = C_{i+1}'(x_i),\qquad\qquad i = 1, \ldots, k-1.$
$C_i''(x_i) = C_{i+1}''(x_i),\qquad\qquad i = 1, \ldots, k-1.$

We can see that there are $k + k + (k-1) + (k-1) = 4k - 2$ conditions, but we need to determine $4k$ coefficients, so usually we add two boundary conditions to solve this problem. There are three types of common boundary conditions: *First* derivatives at the endpoints are known:

$C_1'(x_0) = f_0'\ and\ C_k'(x_k) = f_k'.$

This is called clamped boundary conditions.

Second derivatives at the endpoints are known:
$C_1''(x_0) = f_0'',\ and\ C_k''(x_k) = f_k''$

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The special case $C_1''(x_0) = C_k''(x_k) = 0$ is called natural or simple boundary conditions.

Third when the exact function $f(x)$ is a periodic function with period $x_k - x_0$, $S(x)$ is a periodic function with period $x_k - x_0$ too. Thus

$$C_1(x_0) = C_k(x_k), \; C_1'(x_0) = C_k'(x_k), \; and \; C_1''(x_0) = C_k''(x_k)$$

The spline functions $S(x)$ satisfying this type of boundary condition are called periodic splines. The cubic spline interpolation is a powerful data analysis tool. Splines correlate data efficiently and effectively, no matter how random the data may seem. Once the algorithm for spline generation is produced, interpolating data with a spline becomes an easy task. The missing data are for 2011, 2013, 2015, 2017 and 2019 for the factor markets and the markets for means of production. After applying the method of interpolation by cubic splines, we manage to fill in the missing data. The obtained results together with the initial data are presented in Table 11. A Matlab software utility was used to calculate the results.

Year	Bee products markets BGN	Factor markets, BGN	Markets of means of production, BGN
2010	112 490 000	40 670 000	23 610 000
2011	107 271 062	45 277 458	22 728 113
2012	103 650 000	46 660 000	21 720 000
2013	116 819 357	48 035 042	21 925 138
2014	107 290 000	52 620 000	24 683 000
2015	140 619 328	62 018 625	30 426 213
2016	152 010 000	71 380 000	35 960 000
2017	154 444 378	76 179 208	38 373 638
2018	123 970 000	79 650 000	39 520 000
2019	131 054 547	86 965 792	42 442 863
2020	152 110 000	103 300 000	50 186 000

Table 11: Interpolation of the markets of factors and means of production (2010-2020)

3.4. Correlation analysis of the studied data

The next step in the study is correlation analysis of the data and compilation of a correlation matrix. In our research we assume that the sizes of the studied markets are normally distributed. Correlation analysis is applied to measure the degree of dependence between the studied markets. This problem is solved by finding the so-called correlation coefficients. Since in our case the correlation analysis is performed independently, we will use the Pearson-Bravais correlation coefficient (Bravais, 1890; Pearson, 1895), which is calculated by the formula:

$$r = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})}{\sqrt{\sum_{i=1}^{n}(X_i - \bar{X})^2(Y_i - \bar{Y})^2}},$$

where:
X_i, Y_i – are the individual sampling points, with an index i
$\bar{X}$ – Average value of X
$\bar{Y}$ – Average value of Y
n – Sample size

The absolute values of Pearson-Bravais correlation coefficient are on or between -1 and $+1$: $r \in [-1, +1]$. The Pearson-Bravais correlation coefficient is symmetric: $r(X, Y) = r(Y, X)$. An absolute value of exactly 1 implies that a linear equation describes the relationship between X and Y perfectly, with all data points lying on a line.

The correlation sign is determined by the regression slope: a value of $+1$ implies that all data points lie on a line for which Y increases as X increases, and vice versa for -1. A value of 0 implies that there is no linear dependency between the variables. The interpretation of a correlation coefficient always depends on the context and purposes. A correlation of 0.7 may be low if one is verifying a physical law, but may be regarded as very high in the social or economic sciences, where there may be a greater contribution from complicating factors.

	Bee products markets	Factor markets	Markets of means of production
Bee products markets	1.0000	0.7600	0.7853
Factor markets		1.0000	0.9893
Markets of means of production			1.0000

Table 12: Correlation matrix

Table 12 presents the correlation coefficients between the studied markets. It could be concluded that there is a very high correlation of 0.9893 between the markets of means of production and factor markets. The correlations separately between the factor markets and the markets for means of production with the markets for bee products are also high, respectively 0.7600 and 0.7853.

3.5. Hypothesis testing of the correlation coefficients significance
An important part of the correlation analysis is the verification of the statistical significance of the correlation coefficient. The correlation coefficient is calculated from random sampling data and can be considered as a point estimate of an unknown parameter (coefficient ρ) in the general population. The Student's t-criterion is used as a criterion for hypothesis testing. For this purpose, we present two mutually exclusive hypotheses, respectively null hypothesis H_0 and alternative hypothesis H_1 (OBILOR and AMADI, 2018).

The null hypothesis states that:
- $H_0 : \rho = 0$, i.e. there is no dependence between the studied features and therefore the correlation coefficient r is statistically insignificant.
- The alternative hypothesis is:
- $H_1 : \rho \neq 0$, i.e. there is a dependence between the studied features and the correlation coefficient r is statistically significant.

The risk of error used is $\alpha = 0.05$. We apply Student's t test (t-test), where the empirical characteristic is calculated by the formula:

$$t_{emp} = r \frac{\sqrt{n-2}}{\sqrt{1-r^2}}$$

Here the critical area is determined by the way the alternative hypothesis is set (in this case it is bilateral).

The corresponding value of the theoretical characteristic t_T is determined from (Pearson and Hartley, 1966). Finally, the values of the empirical and theoretical characteristics are compared, as a result of which a decision is made to accept or reject the null hypothesis.

If $t_{emp} > t_T$ – the null hypothesis is rejected and the alternative is accepted, i.e. the correlation coefficient is statistically significant. From a practical point of view, this means that there is a strong significant correlation between the studied traits.

If $t_{emp} \leq t_T$ – the null hypothesis is accepted and the alternative is rejected, i.e. the correlation coefficient is not statistically significant. This means that there is no strong significant correlation between the studied traits. Table 13 presents the matrix values of the empirical characteristic of the Student's t-test (t_{emp}) in the studied markets.

Student's t-test is a statistical method of hypotheses testing and most commonly is applied when the test statistic follows normal distribution. The Student's t-test can be used, for example, to determine if the means of two sets of data are significantly different from each other.

t_{emp}	Bee products markets	Factor markets	Markets of means of production
Bee products markets		3.8780	4.2073
Factor markets			22.4702
Markets of means of production			

Table 13: Empirical characteristics of the Student's criterion in the studied markets

Given a risk of error $\alpha = 0.005$ for a bilateral critical region and degree of freedom $k = n - 2 = 9$, we obtain the theoretical characteristic $t_T = 2.262$, which is the same for all studies because they have the same size of the empirical samples $n = 11$.

From the study it can be concluded that the null hypothesis H_0 is rejected in all cases studied, because in each of them there is a higher value of the empirical characteristic of the Student's t-test than the theoretical characteristic $t_{emp} > t_T$. This could also be seen in Table 14. Therefore, the alternative hypothesis H_1 is accepted and the correlation coefficient is statistically significant. From a practical point of view, this means that there is a strong significant correlation between the studied traits.

	Bee products markets	Factor markets	Markets of means of production
Bee products markets		H1	H1
Factor markets			H1
Markets of means of production			

Table 14: Confirmed hypotheses by studied markets

3.6. Mathematical modeling of the dependence between the studied markets

The presence of a statistically significant correlation dependence is a reason to build a linear one-factor regression model. The linear one-factor model is represented by formula (1):

$$Y_i = \gamma + \beta x_i,$$

where γ and β are regression coefficients.

By (2) the theoretical linear regression models for m1, m2 and m3 are presented.

$$\gamma_1 = \alpha_1 + \beta_1 m_1 + \varepsilon_1$$
$$\gamma_2 = \alpha_2 + \beta_2 m_2 + \varepsilon_2$$
$$\gamma_3 = \alpha_3 + \beta_3 m_3 + \varepsilon_3$$

after the transformations:

$$m_1 + m_2 + m_3 = \gamma_1 + \gamma_2 + \gamma_3 + \beta_1 m_1 + \beta_2 m_2 + \beta_3 m_3 + \varepsilon_1 + \varepsilon_2 + \varepsilon_3$$
$$\gamma_1 + \gamma_2 + \gamma_3 = \gamma$$
$$\varepsilon_1 + \varepsilon_2 + \varepsilon_3 = \varepsilon$$

here ε is the sum of the differences between the theoretical models and their corresponding empirical data. Then we get the equation:

$$m_1 = \frac{m_2(1+\beta_1)}{(1-\beta_3)} + \frac{m_3(1+\beta_2)}{(1-\beta_3)} + \frac{\gamma}{(1-\beta_3)} + \frac{\varepsilon}{(1-\beta_3)},$$

with the most appropriate coefficients for compliance with the empirical data.

$$\gamma = 604\,200.00, \qquad \beta_1 = 297.90, \qquad \beta_2 = 536.10, \qquad \beta_3 = -300.70$$

In equation (3) the differences between the theoretical and empirical data acquire the form $\varepsilon/(1 - \beta_3)$. This difference is mainly due to the high volatility of the agricultural production markets for bee products, as well as speculative and others transactions in the markets of factors and means of production, given the strong interdependence between them. We make the assumption that ε can be represented as a sum of the products of random variables with the sizes of the separate studied markets. If the random variables have a normal distribution with their own expectations μ_i and volatility σ_i, then:

$$\varepsilon \cong m_1 * N(\mu_1, \sigma_1) + m_2 * N(\mu_2, \sigma_2) + m_3 * N(\mu_3, \sigma_3) = \sum_{i=1}^{3} m_i * N(\mu_i, \sigma_i)$$

Therefore, equation (3) is transformed into:

$$m_1 = \frac{m_2(1+\beta_1)}{(1-\beta_3)} + \frac{m_3(1+\beta_2)}{(1-\beta_3)} + \frac{\gamma}{(1-\beta_3)} + \frac{1}{(1-\beta_3)}\sum_{i=1}^{3} m_i * N(\mu_i, \sigma_i)$$

Or

$$m_1 = \frac{1}{(1-\beta_3)} * \left(m_2(1+\beta_1) + m_3(1+\beta_2) + \gamma + \sum_{i=1}^{3} m_i * N(\mu_i, \sigma_i) \right),$$

which could be output to:

$$m_1 = \frac{1}{1 - \beta_3 - N(\mu_1, \sigma_1)}\left(m_2(1 + \beta_1) + m_3(1 + \beta_2) + \gamma + \sum_{i=2}^{3} m_i * N(\mu_i, \sigma_i)\right)$$

The volatility of the factor markets and the markets for means of production is relatively lower than the volatility of the markets for bee products. Assuming that the volatility of the factor markets and the markets for means of production tends to 0, we can assume that, $m_2 * N(\mu_2, \sigma_2) \rightarrow 0$ and $m_3 * N(\mu_3, \sigma_3) \rightarrow 0$ and eliminate them from the model. In this case, equation (5) is transformed into equation (6).

$$m_1 = \frac{(m_2(1 + \beta_1) + m_3(1 + \beta_2) + \gamma)}{1 - \beta_3 - N(\mu_1, \sigma_1)}$$

Mathematical models can be used both to present the development of bee colonies (Atanas Atanasov, Slavi Georgiev, Lubin Vulkov, 2021) and to describe financial, economic and other dependencies in the field of beekeeping. Both equation (5) and equation (6) are suitable for describing the relationship between the markets studied. When choosing to use any of them, the needs of the research, the quality of the available data and the characteristics of the economy in the region and during the analysed time period must be taken into account. Applying equation (6) and according to the current empirical data we get that $\mu = 6.67\%$ and $\sigma = 19.79\%$. It should be noted that with more available empirical data, a better theoretical model can be obtained and the difference can be optimized. For further research, we leave open the question of the nature of this difference. Is it changeable or does it change over time?

4. CONCLUSION

As a result of the conducted statistical analysis of the markets of the Bulgarian beekeeping for the period 2010-2020, the following conclusions can be made:

- The hypothesis for a balance between the product markets of bee products and the markets of factors and means of production in the Bulgarian beekeeping (Lyubenov, 2017) determines the need to study the relationships between them through statistical analysis.
- The survival, prosperity and achievement of supranational competitiveness of the Bulgarian beekeeping depends on the markets of bee products, factors and means of production. The relevance of the study of statistical dependence between them is determined by the markets that generate in a number of agricultural sectors (fruits, vegetables), industries (pharmacy, food) and services (tourism, api-therapy), which create employment, income and Sustainable Development.
- The official agrostatistics does not give an accurate idea of the state and dynamics of the sectoral markets - production, factor and means of production. On the basis of conducted research and additional research on the size of sectoral markets and their dynamics for the period 2010 - 2020, a basis for analysis of the statistical relationship between them has been formed.
- A method for interpolation through cubic splines is applied to calculate the missing data for the factor markets and the markets of means of production in 2011, 2013, 2015, 2017 and 2019.
- Correlation analysis shows a very high correlation between the markets for means of production and factor markets. There is also a high correlation between the factor markets with the markets for bee products and the markets for means of production with the markets for bee products.

- The study found that the above correlation coefficients are statistically significant, i.e. there are significant correlations between the studied traits. This is the basis for the construction of linear one-factor regression models.
- The individual regression dependences can be combined into a general theoretical model represented by equation (3). This model is used to calculate the theoretical dimensions of the studied markets.
- The difference between the theoretical and empirical values of the markets is mainly due to the high volatility of the agricultural production markets for bee products, as well as the markets of factors and means of production. It can be represented as a random variable with distribution, expectation and volatility, assuming that it can be described by a random variable with normal distribution.
- The confirmation of the raised hypothesis allows more precise and perspective planning of the development of the Bulgarian beekeeping, its target markets, the necessary innovations, investments and development prospects.

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APPENDIX

Appendix 1: Product markets

	B2B				B2C			
	Quantities, thousand tons	Prices, BGN/ton	Markets, Million BGN	Grey sector, million BGN	Quantities, thousand tons	Prices, BGN/ton	Markets, Million BGN	Grey sector, million BGN
Conventional honey	7,2	5300	38,1	12,56	3,6	8600	30,88	10,2
Other products			3,8	1,26			3,09	1,0
Organic honey	0,6	7800	4,5	1,50	0,3	11700	3,41	1,1
Other biological			0,5	0,15			0,34	0,1
			46,9	15,5			37,72	12,45
								112,49

Table 2.1.: National markets for bee products for 2010

	B2B				B2C			
	Quantities, thousand tons	Prices, BGN/ton	Markets, Million BGN	Grey sector, million BGN	Quantities, thousand tons	Prices, BGN/ton	Markets, Million BGN	Grey sector, million BGN
Conventional honey	5,8	5300	30,7	10,1	2,9	8600	24,9	8,2
Other products			3,1	1,0			2,5	0,8
Organic honey	1,1	7800	8,7	2,9	0,6	11700	6,5	2,1
Other biological			0,9	0,3			0,6	0,2
			43,3	14,3			34,59	11,41
								103,65

Table 2.2.: National markets for bee products for 2012

	B2B				B2C			
	Quantities, thousand tons	Prices, BGN/ton	Markets, Million BGN	Grey sector, million BGN	Quantities, thousand tons	Prices, BGN/ton	Markets, Million BGN	Grey sector, million BGN
Conventional honey	5,8	5300	30,8	10,2	2,9	8600	25,0	8,2
Other products			3,1	1,0			2,5	0,8
Organic honey	1,3	7800	10,1	3,3	0,6	11700	7,6	2,5
Other biological			1,0	0,3			0,8	0,2
			44,9	14,8			35,76	11,80
								107,29

Table 2.3.: National markets for bee products for 2014

	B2B				B2C			
	Quantities, thousand tons	Prices, BGN/ton	Markets, Million BGN	Grey sector, million BGN	Quantities, thousand tons	Prices, BGN/ton	Markets, Million BGN	Grey sector, million BGN
Conventional honey	6,9	4800	33,1	10,9	3,5	8600	29,7	9,8
Other products			3,3	1,1			3,0	1,0
Organic honey	3,1	7200	22,7	7,5	1,6	11700	18,4	6,1
Other biological			2,3	0,7			1,8	0,6
			61,4	20,3			52,9	17,5
								152,01

Table 2.4.: National markets for bee products for 2016

Appendix 2.1.: Land markets

Farms, no. beehives	Farms, no.	Farm, decare	Price, BGN/decare	Market, BGN million	Turnover, million BGN/year
from 1 to 9	11794	-	-	-	-
from 10 to 49	12099	0,25	837	2,53	0,06
from 50 to 149	3206	1,00	558	1,79	0,04
over 150	378	1,5	279	0,16	0,00
∑	27477			4,48	0,11

Table 4.1.: Land markets in Bulgarian beekeeping for 2010

Farms, no. beehives	Farms, no.	Farm, decare	Price, BGN/decare	Market, BGN million	Turnover, million BGN/year
from 1 to 9	7 612	-	-	-	-
from 10 to 49	8 332	0,25	1641	3,42	0,09
from 50 to 149	2 915	1,00	1094	3,19	0,08
over 150	424	1,5	547	0,35	0,01
∑	19283			6,96	0,17

Table 4.2.: Land markets in Bulgarian beekeeping for 2012

Farms, no. beehives	Farms, no.	Farm, decare	Price, BGN/decare	Market, BGN million	Turnover, million BGN/year
from 1 to 9	6 091	-	-	-	-
from 10 to 49	6 537	0,25	2052	3,35	0,08
from 50 to 149	2 748	1,00	1368	3,76	0,09
over 150	767	1,5	684	0,79	0,02
∑	16143			7,90	0,20

Table 4.3.: Land markets in Bulgarian beekeeping for 2014

Farms, no. beehives	Farms, no.	Farm, decare	Price, BGN/decare	Market, BGN million	Turnover, million BGN/year
from 1 to 9	3 858	-	-	-	-
from 10 to 49	6 196	0,25	2283	3,54	0,09
from 50 to 149	4 172	1,00	1522	6,35	0,16
over 150	1 080	1,5	761	1,23	0,03
∑	15 306			11,12	0,28

Table 4.4.: Land markets in Bulgarian beekeeping for 2016

Appendix 2.2.: Labor markets

Farms, no. beehives	Farms, no.	Labor productivity, BGN/hour	Income, BGN/month	Income, million BGN/year
from 1 to 9	11 794	0,14	24	3,35
from 10 to 49	12 099	0,71	118	17,18
from 50 to 149	3 206	1,42	237	9,10
over 150	378	2,84	473	2,15
∑	27 477			31,78

Table 6.1.: Labor markets in Bulgarian beekeeping for 2010

Farms, no. beehives	Farms, no.	Labor productivity, BGN/hour	Income, BGN/month	Income, million BGN/year
from 1 to 9	7 612	0,17	29	2,63
from 10 to 49	8 332	0,865	144	14,41
from 50 to 149	2 915	1,73	288	10,08
over 150	424	3,46	577	2,93
∑	19 283			30,06

Table 6.2.: Labor markets in Bulgarian beekeeping for 2012

Farms, no. beehives	Farms, no.	Labor productivity, BGN/hour	Income, BGN/month	Income, million BGN/year
from 1 to 9	6091	0,20	34	2,47
from 10 to 49	6537	1,015	169	13,27
from 50 to 149	2748	2,03	338	11,16
over 150	767	4,06	677	6,23
∑	16143			33,12

Table 6.3.: Labor markets in Bulgarian beekeeping for 2014

Farms, no. beehives	Farms, no.	Labor productivity, BGN/hour	Income, BGN/month	Income, million BGN/year
from 1 to 9	3858	0,25	41,66	1,93
from 10 to 49	6196	1,25	208,3	15,49
from 50 to 149	4172	2,5	416,6	20,86
over 150	1080	5	833,2	10,80
∑	15306			49,07

Table 6.4.: Labor markets in Bulgarian beekeeping for 2016

Appendix 3.1.: Veterinary markets

	Conventional beekeeping			Organic beekeeping		
	Beehives, no.	Prices, BGN/ beehive	Markets, BGN million	Beehives, no.	Prices, BGN/ beehive	Markets, BGN million
Varroasis	566 833	6	3,40	46 429	12	0,56
Other	566 833	0,2	0,11	46 429	0,3	0,01
∑			3,51			0,57
						4,09

Table 9.1.1.: Veterinary markets for 2010

	Conventional beekeeping			Organic beekeeping		
	Beehives, no.	Prices, BGN/ beehive	Markets, BGN million	Beehives, no.	Prices, BGN/ beehive	Markets, BGN million
Varroasis	443 771	6	2,66	85 346	12	1,02
Other	443 771	0,2	0,09	85 346	0,3	0,03
∑			2,75			1,05
						3,80

Table 9.1.2.: Veterinary markets for 2012

	Conventional beekeeping			Organic beekeeping		
	Beehives, no.	Prices, BGN/ beehive	Markets, BGN million	Beehives, no.	Prices, BGN/ beehive	Markets, BGN million
Varroasis	470 627	6,5	3,06	106 676	13	1,39
Other	470 627	0,2	0,09	106 676	0,3	0,03
∑			3,15			1,42
						4,57

Table 9.1.3.: Veterinary markets for 2014

	Conventional beekeeping			Organic beekeeping		
	Beehives, no.	Prices, BGN/ beehive	Markets, BGN million	Beehives, no.	Prices, BGN/ beehive	Markets, BGN million
Varroasis	517 643	7	3,62	236 462	14	3,31
Other	517 643	0,2	0,10	236 462	0,3	0,07
∑			3,73			3,38
						7,11

Table 9.1.4.: Veterinary markets for 2016

Appendix 3.2.: Markets for feed and food supplements

	Conventional beekeeping			Organic beekeeping		
	Beehives, no.	Prices, BGN/ beehive	Markets, BGN million	Beehives, no.	Prices, BGN/ beehive	Markets, BGN million
Sugar	566 833	10	5,67	46 429	20	0,93
Other	566 833	0,1	0,06	46 429	0,2	0,01
∑			5,73			0,94
						6,66

Table 9.2.1.: Markets for feed and food supplements for 2010

	Conventional beekeeping			Organic beekeeping		
	Beehives, no.	Prices, BGN/ beehive	Markets, BGN million	Beehives, no.	Prices, BGN/ beehive	Markets, BGN million
Sugar	443 771	10	4,44	85 346	21	1,79
Other	443 771	0,1	0,04	85 346	0,2	0,02
∑			4,48			1,81
						6,29

Table 9.2.2.: Markets for feed and food supplements for 2012

	Conventional beekeeping			Organic beekeeping		
	Beehives, no.	Prices, BGN/ beehive	Markets, BGN million	Beehives, no.	Prices, BGN/ beehive	Markets, BGN million
Sugar	470 627	11	5,18	106 676	22	2,35
Other	470 627	0,1	0,05	106 676	0,2	0,02
∑			5,22			2,37
						7,59

Table 9.2.3.: Markets for feed and food supplements for 2014`

	Conventional beekeeping			Organic beekeeping		
	Beehives, no.	Prices, BGN/ beehive	Markets, BGN million	Beehives, no.	Prices, BGN/ beehive	Markets, BGN million
Sugar	517 643	12	6,21	236 462	23	5,44
Other	517 643	0,1	0,05	236 462	0,2	0,05
∑			6,26			5,49
						11,75

Table 9.2.4.: Markets for feed and food supplements for 2016

Appendix 3.3.: Beehive markets

Beehives, no.	Price per beehive, BGN / piece.	Turnover - 10%, million BGN / year.
613 262	85	5,21

Table 9.3.1.: Beehive markets for 2010

Beehives, no.	Price per beehive, BGN / piece.	Turnover - 10%, million BGN / year.
529 117	90	4,76

Table 9.3.2.: Beehive markets for 2012

Beehives, no.	Price per beehive, BGN / piece.	Turnover - 10%, million BGN / year.
577 303	90	5,20

Table 9.3.3.: Beehive markets for 2014

Beehives, no.	Price per beehive, BGN / piece.	Turnover - 10%, million BGN / year.
754 105	95	7,16

Table 9.3.4.: Beehive markets for 2016

Appendix 3.4.: Markets of bee frames and wax bases - organic and conventional

Beehives, species	Beehives, number	Frames - fruiting body			Frames - shop			
		Number	Prices, BGN / item	Markets, BGN million	Number	Prices, BGN / item	Markets, BGN million	
Dadan Blatt	367957,2	1103872	0,8	0,8831	367957,2	0,55	0,20	
Longstreet Ruth	245304,8	981219,2	0,6	0,59	490609,6	0,6	0,29	
∑	613262			1,47			0,50	1,97

Table 9.4.1.: Markets of bee frames for 2010

Beehives, species	Beehives, number	Frames - fruiting body			Frames - shop			
		Number	Prices, BGN / item	Markets, BGN million	Number	Prices, BGN / item	Markets, BGN million	
Dadan Blatt	340100	1020299	0,8	0,82	340100	0,4	0,14	
Longstreet Ruth	226733	906932,8	0,5	0,45	453466	0,5	0,23	
∑	566833			1,27			0,36	1,63

Table 9.4.1.c: Markets of wax bases (conventional) for 2010

Beehives, species	Beehives, number	Frames - fruiting body			Frames - shop			
		Number	Prices, BGN / item	Markets, BGN million	Number	Prices, BGN / item	Markets, BGN million	
Dadan Blatt	27857	83572	0,96	0,08	27857	0,48	0,01	
Longstreet Ruth	18572	74286	0,6	0,04	37143	0,6	0,02	
∑	46429			0,12			0,04	0,16

Table 9.4.1.o: Markets of wax bases (organic) for 2010

Total for 2010   ∑   **3,76**

Appendix 3.5.: Mechanization funds markets

	Quantity, no.	Price, BGN	Use, year	Turnover, BGN / year
Beekeeper's suit	1	30	3	10,0
Brush - beekeeping	1	6	3	2,0
Lifter	1	6	3	2,0
Smoker - beekeeping	1	25	3	8,3
Fork - beekeeping	1	7	3	2,3
Portable chest	1	30	3	10,0
Small bath - beekeeping	1	63	20	3,2
Centrifuge - manual	1	316	20	15,8
Funds per hive, BGN / year				53,6
Total farms of 1-9 bee families	11 794	Total, million BGN/year		0,632

Table 9.5.1.: Markets of mechanization funds on farms of 1-9 families for 2010

	Quantity, no.	Price, BGN	Use, Year	Turnover, BGN / year
Equipment …	…	…	…	47
Bath - beekeeping, 1m	1	289	20	14,4
Centrifuge electric - 12 frame	1	1173	20	58,7
Maturate for honey - 100 l	1	289	20	14,44
Funds per hive, BGN / year				134,5
Total farms of 10-49 bee families	12099	Total, million BGN/year		1,628

Table 9.5.2.: Markets of mechanization funds on farms of 10-49 families for 2010

	Quantity, no.	Price, BGN	Use, year	Turnover, BGN / year
Equipment …	…	…	…	47
Bath - beekeeping, 2 m	1	542	20	27,1
Centrifuge electric - 20 frame	1	1444	20	72,2
Maturate for honey - 250 l	1	632	20	31,5875
Wax melter - steam	1	1083	20	60
Semi-automatic machine - beekeeping	1	3159	20	175
Funds per hive, BGN / year				412,9
Total farms of 50-149 bee families	3206	Total, million BGN/year		1,324

Table 9.5.3.: Markets of mechanization funds on farms of 50-149 families for 2010

	Quantity, no.	Price, BGN	Use, year	Turnover, BGN / year
Equipment …	…	…	…	69,3
Bath - beekeeping, 2,5 m	1	542	20	27,1
Centrifuge electric - 42 frame	1	1986	20	110
Maturate for honey - 300 l	1	812	20	45
Wax melter - steam	1	1083	20	60
Semi-automatic machine - beekeeping	1	6318	20	350
Dryer for bee pollen - 50 kg	1	2978	20	165
Funds per hive, BGN / year				826,4
Total farms over 50-149 bee families	378	Total, million BGN/year		0,312
Total for 2010 million BGN/year				3,89

Table 9.5.4.: Markets of mechanization funds on farms over 150 families for 2010

EVERY STUDENT WANTS TO WORK FOR A STARTUP – OR NOT? THE RESULTS OF A QUALITATIVE AND QUANTITATIVE STUDY

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ABSTRACT

"Everyone used to want to be a rock star, now everyone wants to be a startupper", they say. But is that really true? Research by the Budapest Metropolitan University (METU) has explored this question, based on a commission by the National Research, Development and Innovation Office (NRDIO) of Hungary. The research was carried out in two phases: in the qualitative module, a total of four focus groups were conducted, while in the quantitative module, 280 university students were interviewed online. The results show that young people clearly associate the world of startups with innovation, and consider them important and useful. However, although they find startups attractive, this is diminished by alleged business risks and other threats they have noticed. Therefore, in addition to working in an interesting and exciting field, on an important project or cause in a startup, the priorities of young people also include the potential for a high income and big money based on the enterprise's success in entering the market. Besides the chance to contribute to innovation and realise the idea, this is one of the decisive arguments for starting or working in a startup. Young people are less likely to actively seek information about startups, but passively they regularly look for information. The three most important forms of this are 1) websites and news sites; 2) social media, Instagram, Facebook, YouTube, Tiktok; and, lagging far behind, 3) influencers. Although relatively few people mentioned television, the impact of the TV show Cápák között ("Among the Sharks", the Hungarian version of the British reality television business programme Dragon's Den) is indisputable in getting someone to think about starting a startup.
Keywords: *startup, startupper, research, university students, innovation, online, social media*

1. INTRODUCTION

"Every student wants to work for a startup", we hear from time to time. But is that really true? Are startups really considered as innovative, important and useful as we might first think? And is it really so attractive to work for a startup as a career starter, or even to found and start your own startup? The Budapest Metropolitan University (METU) was given the opportunity by the National Research, Development and Innovation Office (NRDIO) to map this. The research was carried out in two phases: in the qualitative module, a total of four focus groups were conducted in four universities in three cities, among 18-24 year olds belonging to Generation Z. The quantitative module was based on the results of the focus group and focused on the key questions. The nationwide survey was implemented using an online questionnaire and then we analysed the responses of a total of 280 university students aged 18-35, both full-time and part-time. After a brief introduction to the literature, the study will first review the results of the focus group research, and then highlight the main findings of the questionnaire survey.

2. STARTUP OR INNOVATION COMPANY

As we can see startups in many different industries, there are many different approaches to the concept of a startup. As Paul Graham (2012) succinctly summarises, a startup is a business that has been designed to grow. According to Eric Ries, author of the book "Lean Startup" (2019), a startup is a business that aims to create a new product or service under conditions of extreme uncertainty.

In addition, HiVentures, a startup investment firm, writes on its website (2022) that "a startup is the sum of less tangible things such as faith in an idea, confidence in the future, and investment in a dream." More comprehensive than the former is the definition provided on startupper.hu (2014), which says "if we want to put it simply, we can say that a startup is a company that has a very fast growth potential (a few years), targets international markets rather than regional ones, and introduces an innovative service or product, a niche product that solves problems, all with minimal equity and typically a high knowledge base" (startupper.hu, 2014). Startup expert Imre Hild summarizes the real difference between a traditional enterprise and a startup as follows: "A typical startup is like a baby shark. It has a huge growth potential that comes from its basic structure, its genetics, and makes it grow very fast. By contrast, traditional businesses are like guppies: they are born small and do not grow significantly bigger" (NKFIH, 2014). The predecessor of the National Research, Development and Innovation Office (NRDIO), the National Innovation Office, issued a publication titled "What is a startup? 8 sure signs that you are facing a startup". According to the publication, "Even today, there is still a lot of uncertainty in Hungary about the term startup; many people do not know what kind of enterprises belong to this group, and there are many different approaches and interpretations both abroad and in Hungary." (NKFIH, 2014) The paper summarizes the characteristics of a startup in 8 points: 1) Early stage and small size, 2) High growth potential, 3) Innovation, new, breakthrough idea or technology, 4) Target: global market, 5) High uncertainty, 6) Distinctive work culture and spirituality, 7) Specific funding needs and financing problems, 8) Special sector. HiVentures (2022) highlights similar criteria (but more succinctly): "A startup is, in a nutshell: 1) Innovative, 2) Scalable, 3) Aimed at international markets, 4) High risk ... business venture." And as +1, they also include Team, because, as they say, "an outstanding business idea is useless if the startup lacks a good team." It is interesting to note that although the English word startup has also become widespread in Hungary, in 2017 the Hungarian Banking Association suggested that the term innocompany ('innovállalat') should appear alongside/in place of the term startup (Portfolio, 2017). According to a paper by Paul Graham, Fábián (2021) points out that in the United States alone, millions of businesses are launched every year, but only a minimal percentage of them are startups. Restaurants, service companies and beauty salons are startups only if and when: 1) they have some product, service or business innovation, and 2) this innovation is the source of the high growth potential that makes a newly launched company a startup. Related to the latter is the concept of scaling, which is used to describe potential growth. According to Forbes, "Scalability means that the problem the startup is trying to solve is relevant to many people, not just nationally but also regionally or even globally, and that the solution developed for it can be easily transferred to new markets, ensuring the rapid growth of the startup" (Forbes.com, 2022). The history of startups dates back to the 1970s. It was then that the first tech companies appeared in the US, using innovation as the engine for their growth. Of course, they were not called startups then, but the circumstances in which they started, their business model and product innovation were similar to startups today. Apple and Microsoft, which are now mammoth companies, grew out of these garage companies, points out Fábián (2021). The evolution of the modern startup world began in the 1990s, with the first accelerator and incubator programmes appearing in the early 2000s. Their aim was specifically to attract innovative projects and make them attractive to venture capital firms and investment funds (Polcz, 2020).

3. WORKING AT A STARTUP: PROS AND CONS
It is perhaps no exaggeration to say that the word startup has become part of the professional and wider public discourse. On Amazon.com you can find not hundreds, but thousands of books on startups. Cities around the world are competing to become the new startup capital. The topic is also very often covered by the media in Hungary: for example, a search on the news

aggregation website hirkereso.hu on 22 June 2022 for the word "startup" provided exactly 100 results for the previous month. In as early as 2017, an article on Minner.hu listed 46 organisations to turn to for investment if you have a startup idea. The TV show Cápák között ("Among the Sharks", the Hungarian version of the British reality television business programme Dragon's Den) has shown hundreds of thousands of viewers what ideas investors are looking for. In addition, the Hungarian Startup University (HSUP), linked to the NRDIO, is a free two-semester educational programme connected to all major Hungarian universities. With regard to our narrower topic, job search and placement, it is telling that on the job site Profession.hu (2017) we find an article entitled Élet egy startupban ("Life in a startup") and on the Hungarian website of Randstad they ask the question "Startup or multinational: which one suits me?" (2022). According to the DreamJobs survey (2019), "52% of jobseekers would prefer to work in a startup, and only 28% would choose a corporate work environment. 15 years ago, almost everyone wanted to work for a big multinational, but now many are disillusioned with the multinational atmosphere." It is no wonder that HR Portál published an article entitled Ezért jobb egy startupnál dolgozni, mint egy multinál ("Why it is better to work at a startup than a multinational") (2021), quoting Júlia Sohajda, head of Vespucci Partners: "What challenges does a young person face when faced with a job choice? – many people ask the question. The answer is: more and more challenges. This is one reason why it is important to try out various fields, different jobs and different organisational structures. On the other hand, it is increasingly challenging to take on a job where they feel that the company they work for has a positive impact on the world, which makes their work a value-adding one, while for Generation Z this is even more important than their salary. Young people today increasingly want to be part of the birth, growth and success of a company." The HR Portál article (2021) also collected the pros and cons of working for a startup. According to this list, the pros and cons are:

"Pros:
- Unique experience
- Outstanding learning opportunities
- Employees can work independently (make smart decisions and take responsibility for the consequences, which is likely to improve their performance)
- Innovative and novel approach
- Flexible working hours

Cons:
- High workload (fewer breaks and holidays, as startups need to quickly exploit their potential as early growth is vital)
- Job stability (research shows that over 90% of startups fail in the first three years)
- Lower pay
- High responsibility (technology changes rapidly, making competition fierce, so even small missteps can have big consequences)
- Less structure in the workplace and processes"

4. AIM AND BACKGROUND OF THE QUALITATIVE RESEARCH

At the end of 2021, the National Research, Development and Innovation Office (NRDIO) commissioned a research team from Budapest Metropolitan University to map what young people, and more specifically Generation Z, think about innovation. The first step of the two-phase research was a qualitative survey. The exploratory focus group process formed the basis for the second phase, a targeted questionnaire survey that quantified the significant points of

the problem. (The term 'focus group' was created because it is designed to focus subsequent, usually quantitative, research.) On the other hand, qualitative research can also be used in its own right: the exploration of perceptions and attitudes provides concrete results that can be interpreted in themselves, which may serve as a basis for the formulation of directions of action and recommendations (Schleicher 2007, Babbie 2020). To take into account the different life situations of the target group and the resulting differences of opinion and disagreement, the study sample was filtered according to the geographical location of the university of education and the field of study of university education. Three groups were created according to the geographical location of the university of education:

- West Hungary (University of Sopron)
- Budapest (one group: Budapest Metropolitan University, another group: Budapest University of Technology and Economics – BME)
- Eastern Hungary (Neumann János University, Kecskemét)

In terms of the field of university education, the research covered three groups:

- Participants in economic training
- Participants in technical training
- Participants in social science courses

To get to acquainted with the widest possible spectrum of feedback and attitudes, it was necessary to hold four focus groups. This made it possible to identify the relevant aspects of university students and to control the distorting effects of any opinions that might appear.

Set-up of the qualitative focus group study		
Group 1 (Sopron)	Group 2-3 (Budapest: METU, BME)	Group 4 (Kecskemét)
➢ 18-24 years old ➢ Mixed composition in the field of university education	➢ 18-24 years old ➢ Mixed composition in the field of university education	➢ 18-24 years old ➢ Mixed composition in the field of university education
➢ Both men and women ➢ Even age distribution within the age zone in all groups ➢ At least 2 people per group who have participated in a Scientific Students' Associations Conference (TDK) ➢ At least 2 people per group who work alongside their studies ➢ At least 2 people per group who have their own business or are involved in a family business		

Table 1: Main characteristics of the qualitative focus group study; sampling
(Source: The primary research "Generation Z and innovation" by METU and NRDIO, qualitative module, 2021)

The qualitative research covered several areas, such as: attitudes of Generation Z towards innovation; Meanings and perceptions of innovation; Participation in innovation; Aspects of innovation promotion among 18-24 year old people; Characteristics of innovative thinking; Perceptions of research careers; Self-perceptions of Generation Z. Last but not least, the research also covered: The meaning of and attitudes towards startups; Enterprises and startups; The ideal startup organisation. In this article we present the results of the latter.

5. RESULTS OF THE FOCUS GROUP SURVEY AMONG UNIVERSITY STUDENTS

The qualitative research findings are summarised below in connection with six themes:

1) Primary associations of the term 'startup',
2) Importance of startups,
3) Known startup companies,
4) Generation Z's orientation towards startups,
5) Information about startups,
6) Starting your own startup

What was said verbatim in the focus group is in quotes.

5.1. Primary associations of the word startup

In the focus groups, the following ideas emerged from the 18-24 year old students interviewed about what first comes to mind when they think of startups:

- New enterprise
- Good investment target
- Phone application, phone developments
- Making money fast
- Equality
- Young, fresh company
- Innovation, the implementer of a good idea
- Technological innovation
- Cápák között ("Among Sharks") TV show

Regarding the latter, it is worth quoting: the word startup "reminds me of ... the TV show 'Cápák között'. There's a person and s/he has a product that s/he wants to present, and then s/he asks for help from the big money people there. ... S/he has a startup capital that is not enough to realise the innovation idea, then the investor buys the idea, and so to speak, gives him/her money, and of course the investor also makes a profit."

5.2. The importance of startups

Respondents unanimously agree that startups play an important role in the economy. Startups are important because:

- They lay the foundations for growth
- They force large companies to compete, which induces improvements
- They stimulate and inspire the market
- They create innovations that make everyday life easier

The overall assessment of startups is positive. The big tech success stories (e.g. Microsoft, Facebook) are the basis for this assessment, as they are the prototypes of startups according to the focus group participants. "If you have an idea that changes the world and you only lack the financial background to do it, see Microsoft: they started from a garage and today they are a world leader, or see Facebook: it started as an internal system at a university, and after all, now we couldn't imagine our days without it." It is interesting to note that although they come from a wide range of backgrounds and fields, the respondents would most like to participate in IT startups because they see great opportunities in them. At the same time, money is the key criterion for them to participate in startups: "I would join an enterprise that will grow well afterwards and I can make a lot of money from it."

5.3. Known startup companies

Some of the participants in the focus group research are not very familiar with startup companies or have difficulty identifying them. They had heard of startups of various activities that were set up to implement some new idea. But they often do not know the names of the companies – so they are not really brands yet. In terms of Hungarian startups, came out on top in all four groups. The platform allows restaurants and shops to sell unsold, but good quality food at a discount, thus reducing food waste and providing access to food for a wider range of consumers. They could identify with Munch's objectives easily, as it generated high levels of sympathy and brand awareness. Also mentioned were the bicycle courier company ViddL, iGO Navigation (which started as a Hungarian company but was acquired), and Prezi, which is now known and used worldwide.

5.4. Generation Z in startups

The survey asked how students aged 18-24 perceive the idea of working in startups, as a form of entry into the labour market. Young people see startups as an opportunity for them. Examples of successful startups suggest that they can achieve a faster rise in living standards as young persons starting their career than by following traditional life paths. "I think it has become important because we get out of university as 23-24 year olds and start working. While it takes quite a long time to achieve what you want in a traditional way, if you start in a startup, you can achieve the standard of living you want in as little as 1-2 years." Another person commented, "It's an interesting generational disease that everyone wants to be a leader straight away, but with a startup you have the opportunity to really be a leader if you have a good idea, and that can be motivating." However, startups are perceived to carry higher risk, with more bankruptcies and company failures. In comparison, working as an employee of a multinational gives you more security. "I know a lot of people who like the multinational world, because the company isn't going to disappear overnight. It's not a generational thing, it's a people thing." Or, according to another focus group participant, "Startups are insecure ... At least at the beginning, for sure."

5.5. Finding information about startups

While this is certainly an attractive world for Generation Z, it is not a world in which they actively seek out news about startups, but rather find them as they pick up other information. "An average person or student won't necessarily search for it like that, you have to sort of put it in front of their eyes and then there it is." They mostly search for information on the internet, or rather, they find it in the light of the above. This is their primary source of information. "I read about startups in online newspapers, I don't know, Index or HVG." Or "The Forbes' Facebook page, if you follow it." Social media has a key role in finding their way around, but it is definitely not a targeted search, but something that is shown by Instagram, Facebook, YouTube, or TikTok. "For example, I go on Insta or Facebook, I get an ad and see this whatever company, I am much more likely to click on it (of course if it is in my area of interest). But to search on the internet… I do not think anyone does that, we are not that interested." Or "There are already people on TikTok who do this, like Péter, the mentor from the show "Cápák között" – he puts videos up there, you can ask him questions and he answers them." It is interesting to note the importance of the latter, i.e. the TV show Cápák között and of course its appearance on online channels such as YouTube or TikTok. This was mentioned by several respondents in all focus groups. „I don't look for startups myself, but I have watched the TV show 'Cápák között". Or "Among the Sharks, it's bloody good, I swear, it's so good, when it was on, I always watched it". Here, almost competing with each other, the focus group participants said, "I think we got to know a lot of companies"; "Yes, we could learn a lot from it, that is, what is worth investing in"; „Yes, a lot, how much money can be made from such small things"; "We couldn't

imagine that you can get so much out of such small things. For example, there was a guy the other day, he brought in these little sweets. ... Or lollipops, what a big factory he made for himself, it wasn't a big budget."; „The lángos (a traditional Hungarian fast food made of dough) maker, he was on Facebook afterwards, the whole apartment block was full, everyone wanted to buy a scone from him."; "Yes, he obviously gets a reputation or awareness with it; it's also good to go there from a marketing point of view, if they don't provide support to him, he still gets a reputation." Finally, university lectures were also mentioned among the interviewees, as there were also some where the startup topic was included in the course. „In the Budapest University of Technology and Economics (BME) lecture, they explained quite well what it is worth to build a company on, so you can at least make a break-even or even get some profit. A lot of startups end up in a way that some of them can't even get off the ground, and even if they do, they go bankrupt very quickly. Often a good idea is not enough on its own, you also need to put a model behind it to make it worth investing in."

5.6. Starting your own startup
The members of the four focus groups were roughly similar to the normal distribution on the scale of "I am sure that I will not start a startup" and "I am sure that I will start a startup" and were divided into three categories. Of these, the second, middle group had the highest frequency.

1) Some people shy away from launching a startup in the first place. They justify this decision by perceived disadvantages (e.g. a lot of work, stress). „No, no."; „I definitely don't."; „I definitely know I don't want to start a business." – they said. "Many people don't know that there is another side to this: the 0-24 hours work, the stress. ... They don't tell you that in class, but anyone who is involved knows how thankless it is. Obviously, when you have to pick up the dividends it's a very good thing, but there are downsides."

2) The second and most populous group is the one that is not opposed to the possibility of launching a startup, but they do so with certain conditions. However, it should be noted that there is a general passive expectation of these conditions. The active search for opportunities to launch a startup is rare and almost non-existent. They are not necessarily waiting for the financial background and opportunities, but also for the idea itself. "As soon as I have a good idea, I think I'll just go for it.", said one of them. But even so, they would typically be risk-averse. "If the opportunity comes along and at the right time, if the time and opportunity reveals itself. If there is an idea that is good at that moment and the funding is there, then yes. But I wouldn't say I would take out a loan to do it, I wouldn't risk everything just for that, but I would have to have something else alongside it. I wouldn't have that as my only source of finance, because that's too much of a risk." Or, in connection with the same attitude: "I can agree with that if there is an idea, there is a possibility, let's first look at the market research, whether there is really a demand for it. Putting in millions of forints to make it work for 2 years, and after 2 years bringing the curtain down on it and stay where I was before, I don't see the point. If there is an idea that works for 10-20 years or even longer, that the children can take with them in the future, then fine, and there will be a demand for it in 30 years' time."

3) The third group of people are the ones who would particularly like to launch a startup. They would mostly do it out of curiosity, out of a sense of adventure. "I'd like to start it, I'm curious to see how it will turn out, I'll do it for 2-3 years and if it doesn't work out, it might 'hit the post', but it could also work out well." They mainly identified online business and e-commerce as a potential business area. „I'm going to give you an example of dropshipping

for example, I don't know how familiar it is. The idea is that with dropshipping I am an intermediary between a company and, say, a buyer. In other words, the customer orders the product of that company through me, but he/she doesn't come to me; I just send it, I act as an intermediary, but I also profit from it."

6. AIM AND BACKGROUND OF THE QUANTITATIVE RESEARCH

As discussed earlier, the four focus groups produced results that are meaningful in themselves, and these have been presented above. The focus group module also focused the subsequent quantitative research, which took the form of an online questionnaire survey. Due to space limitations, we can only present its most important results in this article, supported by the corresponding mathematical analyses. During the survey, we interviewed university students online, including both full-time and part-time students. The youngest respondents were 18 years old, while the oldest was 51 years old. However, only respondents aged between 18 and 35 were included in the analysis, and those older than this were excluded. This was also justified by the generational aspect of our research questions. The total sample for analysis was 280 respondents. The sample was well representative of the university student population in terms of age. In terms of age distribution, the highest frequency of responding undergraduate students was from Generation Z. Respondents aged 18-24 years accounted for 70.71% of our interviewees. The majority of respondents (57.86%) were female, which is an approximate representation of the gender distribution of the relevant university students. About 82% of the study sample lives in cities. More than half of all respondents (54.64%) live in Budapest, the capital city of Hungary. The most common groups of survey respondents are students studying economics, social sciences, medicine and health sciences, or technical courses. Last but not least, the financial situation of the sample is characterised by the fact that only 8.57% of them considered themselves to be below average in today's Hungary. The typical response is "average"(54.29%), and overall about 37% rated themselves as "above average" and "highly above average". The quantitative research, like the qualitative one, also consisted of several modules, covering the following topics: 1) Generation Z's attitude towards innovation, 2) Information about scientific novelties and innovative solutions, typical information channels, 3) Starting a business. Last but not least, there was a separate module 4) The World of Startups. We will now focus exclusively on the latter.

7. RESULTS OF A QUANTITATIVE SURVEY OF UNIVERSITY STUDENTS

In the following, we summarise the findings of the qualitative research in terms of four themes:
1) Evaluation of startups,
2) Known startup companies,
3) Startup ideas,
4) Channels to find out about startups.

7.1. Evaluation of startups

For this item, respondents were asked to rate startups on a scale of 1 to 5, similar to the classic school grading system, according to four criteria. As can be seen from the results, the average was essentially close to 4 for all four criteria. The innovativeness of startups received the highest rating (4.16), followed by the importance of startups (3.89), the usefulness of startups (3.87) and finally the attractiveness of startups (3.68). There is an interesting tension in these assessments. Why are the things that are so important and useful not equally attractive? Well, the attractiveness of startups is likely to be reduced by the perceived business risks and other associated perceived threats, which were also highlighted in the focus groups.

Interestingly, there was a significant difference between genders (t-test, $p < .043$) only along the „Attractiveness of startups" scale. These results suggest, perhaps somewhat surprisingly, that female respondents find startups more attractive than men.

	Average
Innovativeness of startups	4,16
Importance of startups	3,89
Usefulness of startups	3,87
Attractiveness of startups	3,68

Table 2: Startups rated on a scale of 1-5 by 18-35 year olds (n=280)
(Source: METU and NRDIO primary research „Generation Z and innovation", quantitative module, 2021)

7.2. Known startup companies

The majority of respondents (61.8%) do not know or cannot identify a Hungarian startup company. There was a weak but highly significant positive correlation (Spearman) between the variable "Do you know Hungarian startups?" and the variable "Age": $rp = .284$ $p < .001$ (2-tailed). The older the respondent (25-35 years old), the more likely he/she was to be familiar with Hungarian startups, compared to younger respondents (18-24 years old). Of course, this could be due to age alone. In any case, the age groups differed with very strong significance (Chi-square test, $P < 0.001$). Almost half of the older age group knows a Hungarian startup company, while only about a quarter of the younger age group does. Genders were also significantly different (Chi-square test, $P < 0.027$). According to the quantitative research, men are more familiar with Hungarian startup companies than women.

7.3. Startup ideas

42.86% of respondents said that "I have not yet had an idea like this" that could be the basis for a startup. This was the most common answer. However, this also means that 57.14% of university students had already had such an idea, but in the end only 2.50% (7 people) out of 280 people have launched a startup based on that idea. 20% of respondents selected the answer "I have/had an idea, but I never thought about starting a business". This means that a third of those who have already had an idea (almost 60% of the total sample) have not even thought about making it reality. 12.14% of the total sample answered "I have/had an idea, but I would not start a company, at most I would work as part of a team". This is almost a quarter of those who have an idea and a third of those who think about implementing it. This response suggests a sharing of risk and responsibility. They are a kind of 'cautiously optimistic' people. 22.5% of respondents said „I have/had an idea and would like to launch a startup". They are the ones who are planning to start a startup. They are probably waiting for an opportunity (financial, professional, partnership) or are in the stage of preparing or setting up a business. But in any case, they are only thinking about it, they have not yet taken the major steps. Finally, as mentioned above, 7 people marked the answer "I have/had an idea and have started a startup". Interestingly, there were significant differences between genders in terms of their startup launch ideas (chi-square test, $p < .046$). Men were more likely to have had a startup idea.

Table following on the next page

	Frequency
I haven't had such an idea yet.	42,86%
I have/had an idea, but I never thought about starting a business.	20,00%
I have/had an idea, but I wouldn't start a company, at most I would work as part of a team.	12,14%
I have/had an idea and want to start a startup.	22,50%
I have/had an idea and started a startup.	2,50%

Table 3: Percentage of respondents who had/have an idea that they would turn into a startup (n=280)

(Source: METU and NRDIO primary research "Generation Z and innovation", quantitative module, 2021)

7.4. Channels to find out about startups

The main and most effective way to reach the target group with relevant information on the subject (innovations, startups, tenders, job advertisements) is through various internet channels. Among the sources of information on startups, the "Internet sites, news sites" channel is used by 80.36% of respondents. The "Social media and content sharing (Facebook, YouTube, TikTok, Instagram, etc.)" information channel is used by 78.57% of respondents. With these frequencies, the access effectiveness of the other information channels is overshadowed by a very large margin. In third place among the sources of information on startups was "Influencers", this channel is used by 22.86% of respondents. Interestingly, this showed a significant difference according to the variable "Gender" (chi-square test, $p < .002$). These results indicate that women are much more likely to get information about startups using influencers' channels and pages.

	Frequency
Internet sites, news sites	225
Social media and content sharing (Facebook, Youtube, TikTok, Instagram, etc.)	220
Influencers	64
Personal channels	60
Events	53
Television	35
Print media	20

Table 4: Percentage of respondents who had/have an idea that they would turn into a startup (n=280)

(Source: METU and NRDIO primary research "Generation Z and innovation", quantitative module, 2021)

Among the sources of information about startups, the use of "Personal channels" is typical for 21.43% of respondents. For "Events", the same percentage is 18.93%. The last two places were occupied by television and print media. Among the sources of information about startups, "Television" was used by 12.5% of respondents. This is a surprisingly low proportion considering how many people in the focus groups said they watched the TV show "Cápák között" – of course, the episodes of the latter are also available online. The "Print media" channel is used by only 7.14% of respondents. In practice, this means that the 18-35 age group can be barely reached through this channel. In addition, using Spearman correlation, the variable "Print media" is (weakly, positively) correlated with the variable "Age".

This means that only a small proportion of older people (25-35 year olds) can be reached through this channel, and that Generation Z (18-24 year olds) are essentially not reached at all.

8. CONCLUSION
The results of our research show that university students consider the role of startups in the economy to be important, as they lay the foundation for growth, stimulate and inspire competition in the market, and create new innovations that make everyday life easier. The world of startups is associated with innovation, and startups are considered important and useful. At the same time, although they do find startups attractive, their attractiveness is not as acknowledged as their innovativeness, importance and usefulness. The attractiveness of startups is reduced by the perceived risks, mainly business risks and other risks associated with them. This is particularly true for founding and launching your own startup, but also for joining startups as an employee. For young people, besides the opportunity to work on an interesting and exciting project or cause in a startup, the potential for an outstanding income and big money if the startup becomes successful is just as important. Besides the chance to contribute to innovation, to turn an idea into reality, this is one of the decisive arguments for choosing a startup. They are less active in seeking information about startups, while passively they regularly inform themselves of the topic. The three most important forms of this are 1) websites and news sites, 2) social media, Instagram, Facebook, YouTube, Tiktok and, lagging far behind, 3) influencers. In addition to these, they can also get information about startups through personal channels and events. Although relatively few people mentioned television, the impact of the business TV show "Cápák között" is indisputable in making someone think about starting a startup. The role of print media, on the other hand, is essentially negligible – and undetectable in the case of 18-24 year olds.

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MODELLING LONG-TERM BOND SPREADS OF EUROPEAN COUNTRIES IN THE CONTEXT OF FINANCIAL INTEGRATION MEASUREMENT

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ABSTRACT

The paper examines the determinants of the Long-term government bond yield spread for 26 EU countries over the period January 2000 to December 2021. For this purpose, an ARDL/Pooled mean group model with 9 country-specific and 2 global factors is applied. The main results show that the traditional fiscal measures (Maastricht criteria) Fiscal Balance to GDP ratio and Gross Government Debt to GDP ratio remain significant factors with a long-run upward pressure effect on the spread. For countries with higher living standards, inflation is the leading long-term driver of the spread. Day-to-day Short Term Rates for Euro area and Euro area stock market volatility, as global factors in the model, have a significant upward impact on the spread, which is more pronounced in the long-run. In the short-run, net interest expense emerges as the most influential factor for both country groups formed.
Keywords: *convergence progress, EU, financial integration, long-term government bond spreads, ARDL, pooled mean group estimation*

1. INTRODUCTION

A strategic priority for the EU is to achieve a high level of convergence and financial integration between member states. In recent years, however, significant crises and stresses of both external and internal nature have accumulated in the European economy and financial system (Zahariev et al. (2020); Zahariev et al. (2021)), putting the achievement of this objective to the test. The very fact that the ECB is currently considering the introduction of a new Anti-Fragmentation Tool is indicative of the accumulated imbalances, even for what is considered to be the most homogeneous group of countries in the EU. This raises again the issue of financial integration: the sustainability of the convergence process, the assessment of its impact on the propagation of shocks, and the effectiveness of policies pursued. According to the most widespread concept, the main approach for assessing financial integration is the price-based method (Baele et al., 2004). It is based on the logic of the law of one price, according to which countries are financially integrated when, other things being equal, the prices (yields) of financial assets do not differ significantly. Typically, the literature does not use absolute prices or yields, but the spread of 10-year government bond yields relative to a benchmark. It should be noted that, both in the literature on the issue and in this study, the objective of the paper is not to measure financial integration directly or to test its role on other indicators and processes. Rather, the aim is the opposite - to test the impact of some macroeconomic factors, fiscal indicators, etc. on the financial integration indicator. The present study adopts the approach of Alexopoulou et al. (2010) as a basis, aiming to deepen the analysis by broadening the sample of countries (all EU countries), a longer period, tests with alternative explanatory variables, etc. On this basis, valuable conclusions can be drawn about the behaviour of spreads (and hence integration processes), influencing factors, for different country groups, etc.

2. LITERATURE REVIEW

A stable government debt position is an important factor in the social system and sustainable economic development of countries. In this regard, there has been an increased interest in empirically exploring the determinants of government bond yields (risk premium). In modelling, researchers apply predictors that can be broadly divided into two main groups - fundamental and sentiment variables. In the first group are country-specific macroeconomic and fiscal indicators, and in the second are global factors to capture changes in investors' risk aversion and investment expectations. For the purposes of this study, we focus on papers that have the interest rate spreads of EU countries as an object of analysis. Codogno et al. (2003) analyze the interest rate differentials of 10 euro area countries and show that the Debt-to-GDP ratio has a positive impact but is significant for only three of them (Italy, Spain, and Austria). Changes in global risk factors, as measured by US swap and corporate bond spreads relative to US Treasury yields, have the largest effect on spreads, especially for the more indebted countries. Heppke-Falk and Hüfner (2004) find that after the introduction of the single currency the expected budget deficit-to-GDP ratio has a positive effect on 10-year interest rate swap spreads for Germany and France. Haugh et al. (2009) also find that the expected budget deficit, together with the debt service ratio (Gross Interest Payments to Current Government Revenue), have a significant and positive effect on the 10-year bond yield spread for euro area countries relative to German benchmark bonds. This relationship is amplified to a non-linear extent by the global risk factor (High yield corporate bonds - 10-year benchmark government bonds). Thus, in a period of crisis (higher risk aversion) a deterioration in the fiscal position can lead to a significant increase in the spread. On the other hand, Bernoth et al. (2012) find that after the start of the European Monetary Union, investors' focus turns to the expected budget deficit and the debt service ratio, at the expense of the debt-to-GDP and liquidity premium. A change in market behaviour is also observed after the 2007 financial crisis. Oliveira et al. (2012) provide evidence that in the pre-crisis period (from January 2000 to July 2007) the main effect on spreads was driven by global factors: stock index returns based on the EURO STOXX50 and the interest rate sensitive variables of the benchmark German government bond yield. According to the authors, this is the result of investors' expectations of future full convergence between Germany and the rest of the euro area. Apparently, during the crisis period (from August 2007 to December 2010) a change occurred, with the biggest impact being the global risk factor (EURO STOXX 50 Volatility Index) and country-specific variables (Quarterly changes in the public debt level, current account deficit, government investment, and inflation). In addition to identifying the significant factors, Alexopoulou et al. (2010) consider another aspect in modelling government bond spreads - what is their short- and long-term impact over time. By applying a dynamic panel error correction model for the period 2001-2008, the authors find that for eight new EU countries a wide range of fundamental factors (external debt-to-GDP, inflation and exchange rates, countries' openness to trade, short-term interest rate spread) have a long-term impact on spreads. In addition, the authors divide countries into two groups depending on their fundamentals. The applied global risk factor for euro area equity volatility is significant in the long-run for the group of countries with a better macro position (Czech Republic, Poland, Hungary, and Romania), but not for the second group of more vulnerable countries (Bulgaria, Latvia, Lithuania, and Slovakia). Csonto and Ivaschenko (2013) apply the same approach to 18 emerging markets in three regions for the period 2001 to 2013. They find that in the long run both country-specific fundamentals and global factors are significant. In the short-run, however, as in times of crises, it is mainly global risk and liquidity factors that shape spreads. Again, it is concluded that global risk aversion has a stronger impact on countries with worse fundamentals. Matei (2021) finds that with the outbreak of the COVID contagion, along with traditional fundamentals and a global risk indicator, the pandemic risk is also a significant variable in the short-run, while country disease mitigation reduces spreads in 14 EMU countries

in the long-run. In summary, the following general relationships can be drawn: (1) global factors have an impact in both the short and long run, with spreads of countries with deteriorating macro-indicators showing higher sensitivity to them; (2) country-specific factors have an impact mostly in the long-run.

3. METHODOLOGY AND DATA
3.1. Model and model application
In studies of this type, attention naturally turns to panel models (Ahn and Schmidt (1995)). They are divided into several broad groups, depending on whether the regression coefficients vary across groups and within periods. At one extreme are models where the coefficients are allowed to vary completely between groups – N number of time-series regressions are developed and the coefficients are averaged (mean group estimator). However, as Pesaran et al. (1999) note, this does not account for the "panel dimension" of the data - it rules out the possibility that some of the coefficients may still be the same. At the other extreme are models in which the coefficients are assumed to be fixed (equal) both with respect to individual groups (cross-sections) and over time. Close to these are fixed effects (Anderson and Hsiao (1981), Arellano (1989)) and random effects models. However, these two extremes do not capture well the possibility that some of the parameters are the same while others are different from cross-section to cross-section. Therefore, Pesaran et al. (1999) propose a different method using another type of optimization procedure (PMG - pooled mean group estimation). It allows to reflect more realistically the nature of some economic processes where part of the changes of the objects are due to general, long-run equilibrium factors and another part to short-run individual characteristics. By incorporating lagged values of the dependent variable and ohe regressors, it is also possible to reproduce the frequently occurring process of going out of equilibrium (deviation from the level determined by long-term common factors) and the subsequent correction of the error. Therefore, a number of studies (Csonto and Ivaschenko (2013), Abbasov (2019), Gan (2014)) apply in particular the PMG framework in the analysis of macroeconomic and financial data. It is well suited for searching for common and different characteristics of groups of countries and their reactions to common external phenomena, and especially for studying different aspects of financial integration. The original PMG model of Pesaran et al. (1997) is based on an autoregressive model including lags of both the independent and dependent variables (ARDL model). If the dependent variable is the bond yield spread, decompose the regressors into fundamental (F) and common (C) factors, reparametrize the model to handle the first differences of the variables, and represent it in error correction form, the basic equation is arrived at:

$$\Delta Spreads_{it} = \phi_i\left(Spreads_{i,t-1} - \alpha_i - \beta_i^{(1)}F_{i,t-j}^{(1)} - \ldots - \beta_i^{(n)}C_t\right) -$$
$$- \sum_{j=1}^{p_i-1} \lambda_{ij}^* \Delta Spreads_{i,t-j} - \sum_{j=0}^{q_{1,i}-1} \gamma_{2ij}^{(1)} \Delta F_{i,t-j}^{(1)} - \ldots - \sum_{j=0}^{q_{ni}-1} \gamma_{2ij}^{(n)} \Delta C_{t-j} + \varepsilon_{it} \quad (1)$$

The expression in parentheses is the long-run relationship, where α_i is the country-specific free term (*intercept*), a $\beta^{(1)}{}_i, \ldots, \beta^{(n)}{}_i$ are the long-run coefficients of the explanatory variables, which are a function of the original ARDL model parameters.

The application of the model goes through several steps, some of which may be omitted. First, the descriptive statistics of the input data should be derived to check for normality, for the presence of collinear series (Bhujabal, et al. (2021), Adekunle et al. (2021)), etc. Next, as probably the most critical point, comes the check for unit root, taking into account cross-sectional dependence in the selection of the test (second generation tests, Barbieri (2009)).

Otherwise, the test and the model may be distorted, leading to spurious results (Mao and Shen (2019), Dong et al. (2018)). On this basis, it is considered whether the variables should be included with their levels or first differences, as PMG successfully works with series that are I(0), I(1), but not I(2). An optional step is testing for cointegration between the dependent and explanatory variables, which gives a preliminary idea of the existence of a relationship. This can be omitted, since if the error correction coefficient resulting from the application of the model itself is negative and statistically significant, then there is a long-run relationship between the series (Abbasov (2019)). The application of the model itself follows, and the main focus here is the determination of the lags of the dependent and independent variables. Many studies take a loose approach with the inclusion of 1 lag determined a-priori (Alexopoulou et al. (2010), Pesaran et al. (1999)). However, some authors apply a more rigorous approach and determine the optimal number of lags using Akaike's information criterion, Hannan Quinn or Schwarz Bayesian criterion (Adekunle et al. (2021), Abbasov (2019)). Some researchers apply the Portmanteau Q test on the residuals (Alexoupoulou et al. (2010)), robustness check and/or panel causality test (Bhujabal et al. (2021)), the purpose of these tests being to confirm the goodness of fit of the model. An important emphasis in the application of the model is the division of the countries in the sample into groups according to a certain indicator and/or the division of the period. On the one hand, the grouping may be in order to include countries in the sample whose data have similar statistical properties so that adequate results can be expected. For example, Adekunle et al. (2021) examine African trading blocs by first examining the data characteristics of the countries in each bloc and, on that basis, estimating an appropriate model. Clustering can also be done as a posterior step after the main model run to reveal additional similarities or differences between countries in the sample.

3.2. Data

The data used in this study cover the period January 2000-December 2021 for all 27 EU countries. The dependent variable is the spread of the long-term interest rate for convergence purposes - 10 years maturity for each country[1] relative to the 10-year Euro area Government Benchmark bond yield [2]. A number of country-specific factors are included as independent variables: Gross Government Debt to GDP ratio, Net Interest Payments to Government Revenue, Fiscal Balance to GDP ratio, Current Account Balance to GDP ratio, Gross External Debt to GDP ratio, Inflation Rates (HICP), GDP per capita in National Currency, Nominal Effective Exchange Rate 42 trading partners, Trade Openness[3]. We use two global factors in the model. The first is a proxy of liquidity conditions, measured by EONIA (Euro OverNight Index Average) computed by ECB and Eurostat as a weighted average of all overnight unsecured lending transactions in the euro area interbank market.[4] We assume that this indicator better represents changes in liquidity and market expectations compared to the raw ECB funds rate, which has a much lower frequency of change. The second global factor reports Euro area stock market volatility (monthly average of EURO STOXX 50® Volatility) [5]. For all data, the series with the highest possible frequency available in the databases were used. All variables were then linearly interpolated to monthly observations using R and EViews and assembled into a panel configuration. Due to a lack of sufficient observations for the interest rate spread, Estonia was excluded from the sample in the process (only 19 observations out of 264 data series available).

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[1] Source ECB: https://sdw.ecb.europa.eu/browse.do?node=bbn4864
[2] Source ECB:
https://sdw.ecb.europa.eu/quickview.do?SERIES_KEY=143.FM.M.U2.EUR.4F.BB.U2_10Y.YLD
[3] All of the variables are unadjusted (i.e. neither seasonally adjusted nor calendar adjusted). Source Eurostat: https://ec.europa.eu/eurostat/data/database
[4] Source and additional information: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=irt_st_m&lang=en
[5] Source: https://www.stoxx.com/index-details?symbol=V2TX

4. ESTIMATION AND RESULTS

To a large extent, the dynamics of the long-term spread for EU countries show similar trends over the period under review (see the blue smoothing lines in Figure 1). At the same time, however, there is a lack of complete homogeneity between their dynamics, even when grouping countries by their EMU membership and timing of joining.
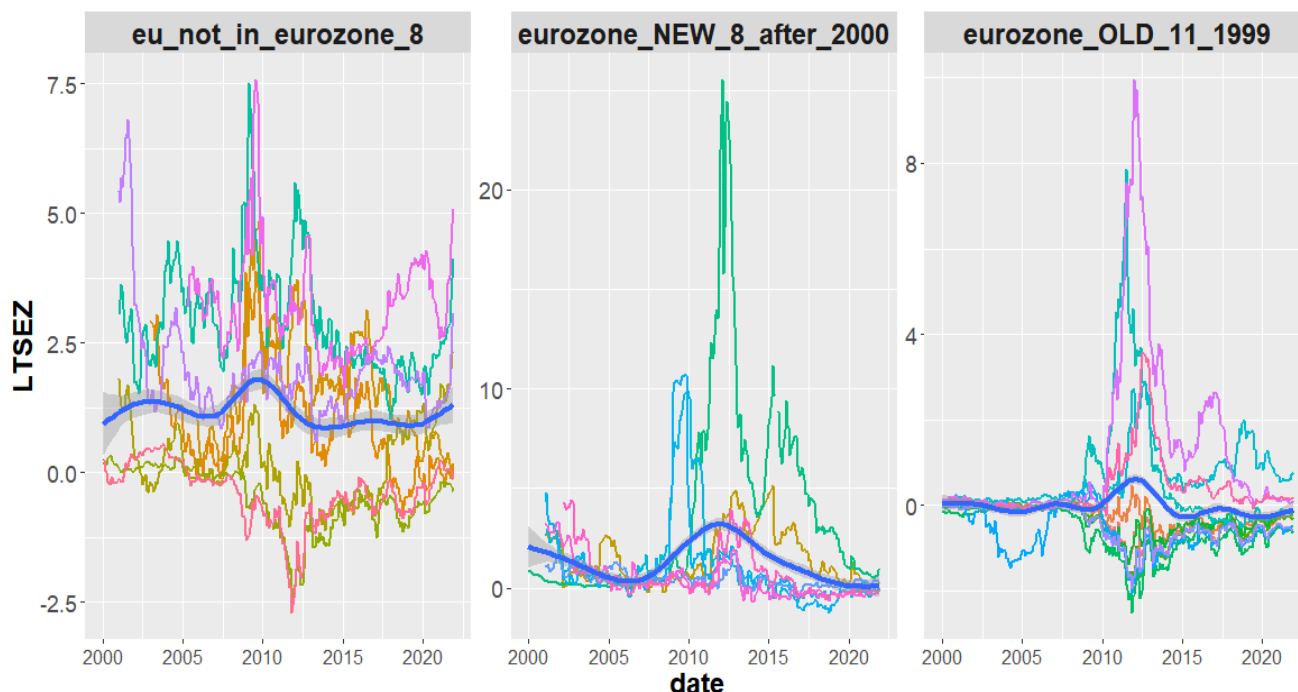
Figure 1: Comparison of dynamics of long-term spreads (%) of three groups of EU countries - non-Euro area (left), the 8 new EMU countries after 2000 (centre) and the first 11 countries included in the Euro area (right)
(Source: Authors' calculation on ECB data)

Expectedly, the highest heterogeneity is observed for the 8 countries that are not yet part of EMU and, accordingly, most of them apply an independent monetary policy. It is noteworthy, however, that this group (mad = 1.72%, range = 10.27%) lacks such extreme deviations as the founding (mad = 0.40%, range = 12.47%) and the new post-2000 (mad = 0.74%, range = 26.74%) countries in the Eurozone. For the whole sample, the average monthly spread is 0.67% (median = 0.10%, mad = 0.79%), with the highest values for Greece (3.56%), Romania (3.26%) and Hungary (2.92%) and the lowest values for Germany (-0.66%), Luxembourg (-0.62%) and Denmark (-0.48%). With such dynamics of the dependent variable, a method and set of factors is needed to account for similarities in long-term trends and country specificities in the short term as well. As a preliminary step, we have derived a correlation matrix of the input independent variables. The results show that there are no extreme correlations. Following the described methodology, we applied a cross-section dependence test and corresponding unit root tests to the input variables. Cross-section dependence was found to be present, but the specific tests (Pesaran et al. (1997) W-stat) applied for unit root confirmed that the inputs were I(0) or I(1), and were therefore included in the model without further transformation. Applying equation (1) in a (1, 1, ..., 1) configuration with the full sample of 26 countries with the independent variables selected, we obtain the results shown in Table 1.

Factors	Description	Coefficient
GGDGDP	Gross Government Debt to GDP ratio	0.011337**
NIPTGR	Net Interest Payments to Government Revenue = (Interest payable – interest receivable)/total general government revenue	-0.126821***
FBGDP	Fiscal Balance to GDP ratio	0.035150*
CAGDP	Current Account Balance to GDP ratio	-0.006983
GEDGDP	Gross External Debt to GDP ratio	0.000269*
IR	Inflation Rates (HICP)	0.227507***
GDPCAPNC	GDP per capita in National Currency	-2.45E-06***
NEER	Nominal Effective Exchange Rate 42 trading partners	-0.044217***
TO	Trade Openness = (Export+Import)/GDP	-0.001806
STRDEA	Day-to-day Short Term Rates for Euro area (changing composition)	0.138599***
EAMV	Euro area stock market volatility (monthly average VSTOXX®)	0.003244
Dependent variable: LTSEZ	Long-term spread relative to Eurozone = 10-year long-term interest rate for convergence purposes minus 10-year Euro area benchmark bond yield (changing composition)	
Short-Run: COINTEQ	Average Error Correction Coefficient	-0.071533***

Note: *** indicates significance at 1%, ** indicates significance at 5% and * indicates significance at 10%.

Table 1: Long-run coefficients for entire sample of countries
(Source: Authors' calculations)

The results for the long-run coefficients for the period January 2000 to December 2021 show (see Table 1) that the two factors with the strongest statistically significant positive impact on the spread are inflation and short-term interest rates. These values and signs confirm the theoretical assumptions of a higher risk premium required by investors under rising inflation and monetary tightening. Of lesser magnitude but with a significant positive impact on the spread are Gross External Debt and Fiscal Balance (Deficit) to GDP. The GDP per capita factor has a negative coefficient with high statistical significance, which is consistent with economic theory, namely that higher economic standard corresponds to a reduction in the interest rate spread. Similarly, the effective exchange rate also has an impact, which can be explained by an improvement in the international currency position, solvency, and competitiveness of the economy. Statistically significant, but of unjustified value in terms of financial and economic logic, is the factor "Net interest expenditure as a percentage of government revenue". From the short-run equation for the whole model, the error correction coefficient has a negative value (COINTEQ = -0.071533***) and statistical significance, indicating the presence of cointegration dependence, thus confirming the significance of the model and the corresponding economic linkage between countries. The presence of not very strong country homogeneity in terms of the dynamics of both the spreads and the independent variables justifies further analysis of the results. Following the logic of the model, we proceed to group countries, the idea being to include in each group countries that are more homogeneous among themselves. In analogy with Alexoupoulou et al. (2010), we divide countries into two groups, bottom group and top group, falling below or above the median value of a given macro-indicator, respectively. To this end, we test grouping by GDP per capita, Current Account Balance to GDP and Gross External Debt as a percentage of GDP. The resulting groupings on the three criteria do not differ significantly.

We consider a country to be in the top or bottom group if, according to at least two of the three criteria, it falls into this group. Ultimately, this corresponds perfectly to a grouping by GDP per capita in EUR.[6]

Group Factor	Upper group	Bottom group
GGDGDP	0.0194***	0.026892**
NIPTGR	0.0186	-0.279662**
FBGDP	0.098115***	0.070403*
CAGDP	0.002844	-0.022331
GEDGDP	0.000255	-0.00209
IR	0.345731***	0.113172
GDPCAPNC	1.98E-05**	-4.28E-06***
NEER	-0.016568	-0.074779***
TO	-0.009725**	0.010236
STRDEA	0.13031***	0.14785*
EAMV	-0.020232***	0.06185***

Note: *** indicates significance at 1%, ** indicates significance at 5% and * indicates significance at 10%.

Table 2: Long-run coefficients for upper and bottom group of countries
(Source: Authors' calculations)

The values of the long-term coefficients (see Table 2) show that the largest positive impact on the spread for both groups is caused by the dynamics of short-term interest rates, which are mainly influenced by the policy of the European Central Bank. The other global factor, the proxy for risk aversion (EAMV), has a coefficient with a high positive and significant value for the bottom group of countries. This indicates that they are more vulnerable to market sentiment, especially in the context of deteriorating fiscal discipline. Of the country-specific factors, inflation exerts strong upward pressure, but only for the upper group. In the opposite situation, the exchange rate parameter is significant for the bottom group, which can be explained by an improvement in the ability to repay foreign currency loans when the weighted average exchange rate appreciates. The traditional measures of fiscal position (Gross government debt to GDP and Fiscal Balance to GDP) have positive and statistically significant coefficients for both groups. In terms of short-run dynamics (see Tables 3 and 4), the first thing that is notable is the statistically significant negative coefficients on the error correction for all countries except Ireland, confirming once again the presence of cointegration dependence for both groups. The apparent presence of sign heterogeneity in front of the coefficients of some fundamental and global factors is not unprecedented and has been observed in the literature using the ARDL/PMG model (Alexopoulou et al. (2010), Csonto and Ivaschenko (2013), Matei (2021)). There are some significant differences between the factor dynamics in the long-run and short-run parts of the model. Here, net interest payments emerge as the strongest factor in the short-run for both groups. Total indebtedness (GEDGDP) is also a statistically significant factor in the short-run and mainly affects the spreads of the bottom group (mostly Romania, Greece, Bulgaria, Poland). The positive coefficients of the Trade openness (TO) factor can be explained by the negative impact of the increasing openness of some of the bottom group countries on the current account balance, which in turn translates into an increase in the spread. On the other hand, as with the long-run, there is a positive relationship between government debt (GGDGDP) and the long-run spread - most of the top and bottom group countries have positive

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[6] The upper group includes Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Spain, Sweden. In the bottom group are Bulgaria, Croatia, Czechia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia, Slovenia.

significant coefficients. In terms of the FBGDP factor, the coefficients for Greece, Portugal and Hungary show high impact. The GDPPC variable in both groups has coefficients very close to zero, with variable signs, but at the same time statistically significant. This can be interpreted as no impact of short-term changes in living standards on the spread.

Variable / Country	COINTEQ	D(GGDGDP)	D(NIPTGR)	D(FBGDP)	D(CAGDP)	D(GEDGDP)
Austria	-0.064***	0.0028***	-0.059	-0.0434***	0.003***	0.0055***
Belgium	-0.0561***	-0.0048***	0.3382	0.0029	-0.0036***	0.0054***
Cyprus	-0.0169***	-0.0328***	0.6842***	-0.2035***	0.0074***	0.0016***
Denmark	-0.0948***	0.0099***	-0.2169	-0.1046***	-0.0131***	-0.0112***
Finland	-0.0752***	-0.0161***	0.244**	-0.0747***	-0.0012***	0***
France	-0.0763***	-0.0068***	0.4194**	-0.1334***	-0.004***	-0.0003***
Germany	-0.1368***	-0.0068***	3.5565***	-0.2676***	0.011***	-0.0094***
Ireland	0.0649***	-0.09***	-0.4667**	-0.1889***	-0.0037***	0.0012***
Italy	-0.0334***	0.012***	0.6782***	0.038***	0.0221***	-0.0217***
Luxembourg	-0.0442***	0.0273***	-0.1064	-0.0016	0.0041***	0***
Netherlands	-0.1179***	0.0304***	-2.0393**	-0.0985***	0.0019***	-0.0029***
Spain	0.0116***	-0.0276***	0.012	-0.1003***	0.0331***	0.0022***
Sweden	-0.0423***	0.0307***	-0.5422***	-0.0955***	0.0132***	-0.0086***
Variable / Country	D(IR)	D(GDPCAPNC)	D(NEER)	D(TO)	D(STRDEA)	D(EAMV)
Austria	-0.0108***	0.0001***	0.015***	0.0033***	-0.0855***	-0.0027***
Belgium	-0.0172***	0***	0.0158***	-0.0028***	-0.0737***	-0.0001***
Cyprus	0.0142***	0***	-0.07***	-0.0075***	0.1071*	0.0041***
Denmark	-0.0381***	0***	0.0089***	-0.0025***	0.0988***	-0.0029***
Finland	-0.0226***	0.0001***	0.0167***	0.0024***	0.0015	-0.0026***
France	-0.0277***	0***	0.01***	0.006***	-0.0316***	-0.0024***
Germany	-0.0354***	0.0001***	0.0038***	0.0002	0.1957***	-0.0046***
Ireland	-0.0355***	-0.0001***	0.0046***	-0.0059***	-0.084**	-0.0042***
Italy	-0.0098***	0***	-0.021***	-0.0109***	-0.0456***	0.0059***
Luxembourg	-0.0119***	0***	0.0489***	-0.003***	0.1604***	-0.0036***
Netherlands	-0.0215***	0***	0.0254***	0.0065***	0.0789***	-0.0031***
Spain	-0.0063***	0.0001***	-0.0503***	-0.0056***	0.0391**	0.002***
Sweden	-0.025***	0***	0.0182***	0.0018***	0.0181**	-0.0063***

Note: *** indicates significance at 1%, ** indicates significance at 5% and * indicates significance at 10%;
D(…) denotes the first difference of the variable

Table 3: Short run dynamics and error-correction coefficients
for upper group of countries
(Source: Authors' calculations)

Overall, global factors can be said to have less influence in the short-run. The exceptions are Bulgaria and Hungary in the bottom group, where the specific coefficients are higher than the long-run equation. The short-run market volatility (EAMV) shows that investors take the long-run bonds of some countries as a safe haven within the Community (e.g. Germany and the Netherlands). For other countries, this factor influences the spread widening (Greece and Italy).

Table following on the next page

Variable / Country	COINTEQ	D(GGDGDP)	D(NIPTGR)	D(FBGDP)	D(CAGDP)	D(GEDGDP)
Bulgaria	-0.125***	0.0712***	1.8972	-0.0791***	0.0159***	0.0459***
Croatia	-0.09***	0.0089**	1.2644**	0.061**	0.0177***	-0.0334***
Czechia	-0.0117***	-0.0155***	-1.1255*	-0.1162***	-0.0073***	-0.0092***
Greece	-0.0056***	0.0149***	1.6114**	0.3098**	0.0357***	0.0876***
Hungary	-0.07***	-0.014***	1.1441**	0.1145***	0.0216***	0.0044***
Latvia	-0.0897***	0.0273***	3.0707**	-0.4706***	0.0109***	-0.0005
Lithuania	-0.1134***	-0.092***	1.73*	-0.2337***	0.0258***	-0.0049*
Malta	-0.0435***	-0.0269***	0.628*	0.0059*	0.003***	0.0006***
Poland	-0.0787***	-0.0656***	0.2012	0.0513***	0.0184***	0.0302***
Portugal	-0.0548***	0.0538***	2.0564***	0.1398***	-0.0215***	-0.0635***
Romania	-0.1053***	-0.1144***	0.32	-0.0479	0.0517***	0.1013***
Slovakia	-0.1506***	-0.0671***	2.3503**	-0.053**	0.0292***	-0.0024***
Slovenia	-0.0613***	0.029***	0.3497*	0.0062	0.0353***	-0.0409***

Variable / Country	D(IR)	D(GDPCAPNC)	D(NEER)	D(TO)	D(STRDEA)	D(EAMV)
Bulgaria	-0.0171***	0***	-0.1158***	-0.0074***	0.466**	0.0013***
Croatia	-0.0521***	-0.0001***	0.0241***	-0.0051***	-0.3854***	-0.0039***
Czechia	-0.0231***	0***	0.0274***	0.0142***	-0.2741***	-0.0008***
Greece	-0.0717***	0***	-0.2583***	-0.0249***	-0.3975	0.0241***
Hungary	-0.0378***	0***	-0.0953***	0.0107***	0.089**	0.0091***
Latvia	-0.0223***	0.0006***	0.0384***	0.0211***	-0.5849***	-0.0058***
Lithuania	0.123***	-0.0001***	0.0875***	-0.0036***	-2.3294***	-0.0208***
Malta	-0.0073***	-0.0001***	-0.0086***	-0.0061***	0.1102***	-0.0044***
Poland	0.0254***	0.0002***	-0.0021***	0.0188***	0.0801**	0.0033***
Portugal	0.0223***	-0.0001***	-0.0767***	0.0287***	-0.021	-0.0039***
Romania	-0.0298***	0.0001***	-0.0277***	0.0053***	0.0204	-0.0023***
Slovakia	0.0278***	0.0002***	-0.0712***	-0.0001**	0.0371	-0.0086***
Slovenia	0.0013	0.0002***	-0.0713***	-0.0068***	-0.1136**	0.0036***

Note: *** indicates significance at 1%, ** indicates significance at 5% and * indicates significance at 10%;
D(...) denotes the first difference of the variable

Table 4: Short run dynamics and error-correction coefficients
for bottom group of countries
(Source: Authors' calculations)

The high significance of the short-term factors for both groups indicates that the grouping has an added value to the descriptive ability of the model (compared to the overall group). This is an indication that the countries in the individual groups show a higher degree of convergence.

5. CONCLUSION

Based on the above, the following main conclusions can be drawn:
- For the whole sample and for the two formed groups (above and below the median value of GDP per capita in EUR), the traditional measures (Maastricht criteria) Fiscal Balance to GDP ratio and Gross Government Debt to GDP ratio have a long-term upward pressure effect on the spread. For countries with a higher standard of living (upper group) Inflation Rates is the leading long-term driver of the spread.
- Global factors (Day-to-day Short Term Rates for Euro area and Euro area stock market volatility) have a significant upward impact on the spread, which is more pronounced in the long-run.
- Net interest payments emerge as the strongest factor in the short-run for both groups.
- The differences in the direction of influence and the set of relevant factors between countries in the short-run shows that the EU has a long way to go to achieve the strategic goal of high financial integration.

- With respect to the empirical application of the ARDL/PMG model, the biggest problem is the imbalance in the panel (incomplete data for some countries). Also, the results are sensitive to the grouping of countries, which could become even clearer with a more in-depth examination of the grouping criteria (as a direction for future work).

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SOCIAL ENTERPRISES IN BULGARIA

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ABSTRACT
The social economy is part of the economy whose main purpose is to improve the quality of life of vulnerable groups or the implementation of social missions. In modern European context, the social economy is an established and integral part of the social environment and social protection networks, which generates and combines successfully the economic profitability and social solidarity. Social entrepreneurship is a different kind of economic activity, which combines and balances social and economic goals. The development of social entrepreneurship is one of the main objectives of the EU strategy for growth "Europe 2020", as it would have to contribute to an intelligent and sustainable growth and at the same time, to reduce poverty and social exclusion. The social enterprise differs significantly from both traditional business organisation and charitable organisations. Social enterprises combine their ideal goal with a long-term business model. The establishment and operation of social enterprises derive a number of important economic and social effects. In this context the main objective of this article is to is to make an analysis and assessment of the status and the development of social enterprises in Bulgaria. The main research methods are used herein the method of comparison; the graphic method; an index method, SWOT analysis.
Keywords: *Development, Social economy, Social enterprise, Social entrepreneurship, State*

1. INTRODUCTION
The social economy is part of the economy whose main purpose is to improve the quality of life of vulnerable groups or the implementation of social missions. In modern European context, the social economy is an established and integral part of the social environment and social protection networks, which generates and combines successfully the economic profitability and social solidarity. Social entrepreneurship is a different kind of economic activity, which combines and balances social and economic goals. The development of social entrepreneurship is one of the main objectives of the EU strategy for growth "Europe 2020", as it would have to contribute to an intelligent and sustainable growth and at the same time, to reduce poverty and social exclusion. The social enterprise differs significantly from both traditional business organisation and charitable organisations. Social enterprises combine their ideal goal with a long-term business model. The establishment and operation of social enterprises derive a number of important economic and social effects. In this context the main objective of this article is to is to make an analysis and assessment of the status and the development of social enterprises in Bulgaria.

2. LITERATURE REVIEW
The social economy is a part of the economy, sometimes referred as the third sector (the other two are private sector and public sector). The social economy is increasingly convinced identified as an autonomous but a multifaceted area of science and practice relating to the

quality of life of the people (Ivanova, 2017, p. 11). Concepts relating to the social economy permanently enrich their content characteristic on the basis of dynamic processes in the modern economy, analysed as science and practice (Krastev & Krasteva, 2017, p. 133). Over the last decade, the social economy has become more and more important for the development of the countries (Dimitrova & Parvanov, 2017, p. 787). The social economy is a sector that contributes significantly to the creation of employment, sustainable growth and a more equitable distribution of income and wealth. The philosophy of this type of economy is related to the weak social positions and the role of the state and the market in solving the emerging social problems (Todorova, 2019, p. 14). It is a sector in which it is possible to combine profitability with social inclusion and democratic systems of government, and working together with the public and private sector to achieve consistency between services and needs (Kicheva, 2017, p. 54-55). Unlike the private sector, where the main purpose of the organisations is profit, in the third sector, the main objective is improving the quality of life of vulnerable groups and social missions. The social economy connects informal with formal economics, unifies communities and smooths economic and social problems (Parvanov & Dimitrova, p. 1525). The social economy is both a part of the real economy and part of the civil society, in which physical and/or legal persons, associations of volunteers or other organized entities are engaged in business activities in public benefit and reinvest profits to achieve social goals (Министерски съвет, 2011). The development and implementation of a National Concept for Social Economy (Министерски съвет, 2011) is a continuation of the work of the Ministry of Labor and Social Policy (MLSP) team for complete harmonisation of social policies with the best practices of EU Member States on the basis of the findings and conclusions made in the open method of coordination for the social protection and social inclusion for the application of the flexibility of the labour market, combined with the security and implementation of the active inclusion approach. The scope of the social economy includes volunteering, donating, the activities of social enterprises, cooperatives. The Bulgarian social conditions also refer to so-called temporary employment, which is offered to long-term unemployed persons for the purpose of adaptation and subsequent transition to the private sector of the economy (Институт за социално предприемачество). In modern European context, the social economy is an established and integral part of the social environment and social protection networks that successfully generate and combine economic profitability and social solidarity. The social and solidarity economies are two complementary concepts that make an unprecedented attempt to link the three poles - market, state and reciprocity. The social element is related to the implementation of activities for the public benefit. The solidarity element is in meeting the needs of the needy or the community through mutual assistance, association and equality. Solidarity is at the heart of the qualitatively new interconnections between those who create and participate in this kind of economy (Todorova, 2019, p. 16). The social economy is a holder of democratic values that put people first, creating jobs and promoting active citizenship. The development of the potential of the social economy is depending on the adequacy of the political, legislative and operational conditions. The real existing entities with social economic and humanitarian activities in the country claim more and more insistently the need for legal and institutional differentiation in the real economy, so that they can develop their potential and to interact on an equal footing both to achieve a synergistic social impact each other and interaction with the State and corporate economy (Министерски съвет, 2011). In fact, at the heart of the social economy is a social impact and interaction that often perceived as objectively measurable position of some people against the other and "can also be seen as a starting point for the formation of social relationships. From this point of view, social impact may be expressed in modern management and through social investment and philanthropy, as essential elements of the corporate and social responsibility (Usheva, 2013, p. 62).

The social economy is a field to which the European Union shows continued interest and invest in its continuous development and improvement, in order to respond to the current social needs in the Community countries. The modern European social model is characterised by a high level of services, goods and jobs generated by the social economy. At the core of this model is the regulation of the production and delivery of many social services of public interest.The values of the social economy are closely connected with the overall objectives for social inclusion and decent working conditions, training and reintegration into the labour market. Social economy examines the human with his constantly increasing needs as the ultimate goal of economic development, social entrepreneurship as part of its nature and content and social enterprise as one of the entities to achieve objectives (Atanasova & Rinkova, 2017, p. 146). The social economy in Europe provides paid employment to more than 13.6 million people, ie about 6.3% of the working population in the EU-28. It includes about 2.8 million alternative economic structures, managed by about 11 million employees (co-owners), ie 10% of European business is part of the social economy. Its contribution to Europe's GDP is 8%. Cooperatives are one of the leading actors in the social and solidarity economy. In Europe, agricultural cooperatives account for the largest market share - 60% of the market share in the agricultural processing and supply sector. Credit cooperatives are quite popular - around 4,200 in Europe, with nearly 50 million members. The European social economy is very important for both people and the economy.

It provides (Todorova, 2019, p. 17):
- employment of over 19.1 million people in the workforce, incl. paid and unpaid;
- more than 82.8 million volunteers, equivalent to 5.5 million full-time workers;
- more than 232 million members of cooperatives, mutual societies and other similar organizations.

Social entrepreneurship is a different way of economic activity (doing business), that mixes the resourcefulness of business with a social mission, skillful matching and balancing of social and economic goals (Институт за социално предприемачество). It is one of the most innovative ways to achieve a better quality of life, independence and inclusion in society of persons from vulnerable groups. Both private businesses and the public sector are unable to pay enough attention to the social needs of the suffering groups, especially when the sufferers are a large part of the country's population (Dimitrova, 2017, p. 187). The development of social entrepreneurship is one of the main objectives of the EU strategy for growth "Europe 2020", as it would have to contribute to an intelligent and sustainable growth and at the same time, to reduce poverty and social exclusion. Enterprises of the social economy in its various forms (including social enterprises) play an important role in enhancing the competitiveness and efficiency of the European economy in many different ways: by targeting the fragmented and unused resources to economic activity, the mobilisation of resources at the local level, strengthening the culture of entrepreneurship, elimination of market rigidities, fostering flexibility of markets, the production of a host of places like this are just a few examples. Enterprises of the social economy also have a greater capacity to preserve employment and preventing the loss of jobs during difficult stages in the economic cycle, as we observe now (Kicheva, 2017, p. 55). Social economy enterprises are managed as businesses, producing goods and services for the market economy and direct part of their resources in the implementation of the social and environmental objectives (Министерски съвет, 2011). Social enterprise can be viewed as a tool aimed at the harmonisation of socioeconomic development. It differs significantly from traditional business organisation on the one hand, and on the other by the organisations with charitable purposes.

Social enterprise has a pronounced social impact-characterised by a balance between seeking to make a profit and the direct support of the social status of certain groups persons, i.e. the carrying out of activity in order to generate revenue is determined by who is benefiting from the activities and results. According to its legal definition, a "social enterprise" means an undertaking, regardless of its legal form, which by its founding treaty or statute"has as its primary objective the achievement of a measurable, positive social impact rather than generating profit for its owners, members and shareholders ". It also "provides services or goods that generate social return and/or use a method for the production of goods or services who embodies its social purpose ". The "Social enterprise" also uses its profit in the first place to achieve its primary objective and has introduced predetermined procedures and rules of any distribution of profit among shareholders and owners, which guarantees that this allocation shall be without prejudice to the primary objective. It also manages the entrepreneurial, accountable and transparent manner, in particular through the inclusion in the management of employees, clients and stakeholders affected by its business activities in the management (Георгиева, 2017). Social enterprises combine perfect aim with a long-term business model. Unlike ordinary non-governmental organisations (NGOs), they do not rely on grants and donations, but build a model of financial stability by selling their services. Unlike traditional businesses, however, they do not aim to maximize their profits, but to fulfill their social mission (Димитров, 2015). Social enterprises are businesses that trade in order to tackle the major challenges we face in society. Social enterprises are businesses that are changing the world for the better. Like traditional businesses they aim to make a profit, but it's what they do with their profits that sets them apart – reinvesting or donating them to create positive social change. Social enterprises are in our communities and on our high streets – from coffee shops and cinemas, to pubs and leisure centres, banks and bus companies. They make their money from selling goods and services in the open market, but reinvest their profits back into the business or the local community. By selling goods and services in the open market, social enterprises create employment and reinvest their profits back into their business or the local community. This allows them to tackle social problems, improve people's life chances, provide training and employment opportunities for those furthest from the market, support communities and help the environment. Social enterprises exist in nearly every sector from consumer goods to healthcare, community energy to creative agencies, restaurants to facilities management. Well known examples include The Big Issue, Divine Chocolate and the Eden Project but there are over 100,000 social enterprises throughout the country contributing £60 billion to the economy and employing two million people. They're creating jobs and opportunities for those most marginalised from the workforce, transforming the communities they work in and making the Sustainable Development Goals a reality. It's business for good and when they profit, society profits.

We define social enterprises as businesses that (Social Enterprise UK, 2016):
- Have a clear social and/or environmental mission set out in their governing documents
- Generate the majority of their income through trade
- Reinvest the majority of their profits
- Are autonomous of the state
- Are majority controlled in the interests of the social mission
- Are accountable and transparent.

As a a study on the state of social entrepreneurship in the UK makes clear, social enterprises are working across a wide range of areas: creating jobs and new opportunities, supporting the most vulnerable in society, reducing our environmental impact, and improving people's healthcare (Social Enterprise UK, 2017).

Key findings of this research: the social start-up wave continues; working where it is needed; this is business; selling to the public; delivering public services at scale; more innovative than the private sector; commercially resilient; female entrepreneurship; diverse leadership; local employers; creating opportunities in tough times; under pressure on margins and business models; a fair paying field; financial times - access to appropriate finance remains the biggest barrier for start-ups and established social enterprises; demand for smaller deals.

3. ANALYSIS OF THE SOCIAL ENTERPRISES KEY INDICATORS IN BULGARIA

Social enterprises in Bulgaria operate in several directions: delivery of social services; provision of employment of people with disabilities; mediation in employment of unemployed persons; provision of health services; activity in the field of education, etc. In the implementation of these activities is not leading the production of finished product, but the social impact on individuals themselves, to gain the necessary support in order to integrate into society. The Economic and Social Council of the Republic of Bulgaria (ESC) has repeatedly stated in various acts that social entrepreneurship has a major role to play in social cohesion and the creation of growth and jobs. The topological characteristics of this type of entrepreneurship in Bulgaria do not differ greatly from those of similar enterprises in the rest of Europe. The following tables presents numerical data on key indicators of enterprises in Bulgaria, which identified themselves as social.

Indicators	Year					
	2012	2013	2014	2015	2016	2017
Enterprises (number)	2 717	2 046	2 526	2 713	2 577	2 534
Enterprises with profit (number)	1 881	1 381	1 748	1 921	1 770	1 800
Turnover (in thousands of BGN)	3 344 890	5 375 261	2 622 909	1 360 285	1 166 609	1 311 425
Value added at factor cost (in thousands of BGN)	673 138	597 694	502 929	437 806	325 709	378 323
Revenue (in thousands of BGN)	3 597 289	5 557 597	2 829 653	1 540 749	1 290 751	1 416 446
Costs (in thousands of BGN)	3 419 789	5 611 198	2 847 258	1 443 783	1 214 058	1 314 381
Fixed assets (in thousands of BGN)	1 237 116	1 582 663	1 144 740	622 374	570 367	520 677
Employed (number)	41 939	32 561	28 880	23 919	17 272	17 189
Employees (number)	40 545	31 158	26 991	21 768	15 580	14 988

Table 1: Indicators on non-financial enterprises, which identified themselves as social for the period 2012-2017
(Source: for 2012-2013 National database of MLSP for social enterprises in Bulgaria,
Availabe online at: http://seconomy.mlsp.government.bg/db/bg/nsi
for 2014-2017 NSI data provided to the authors as a paid service
Note: Data for social enterprises for 2017 are the latest NSI data)

As can be seen from this table the number of non-financial enterprises, which identified themselves as social for the period 2012-2017, fluctuates in different years of the period. The share of profit-making enterprises is lowest in 2013 (69.50%) and highest in 2017 (71.03%). There is no stable trend in the dynamics of the financial indicators characterizing the activity of the non-financial enterprises. There is a continuous decrease in the number of employed and employees during the period.

Indicators	Year					
	2012	**2013**	**2014**	**2015**	**2016**	**2017**
Enterprises (number)	2 155	1 566	2 194	1 969	1 897	1 898
Enterprises with profit from business (number)	253	197	295	280	249	246
Revenue from business (in thousands of BGN)	20 594	22 116	30 737	24 060	23 783	25 644
Costs for business (in thousands of BGN)	17 036	15 467	23 582	19 892	20 671	22 181
Revenue from non-economic activities (in thousands of BGN)	168 281	179 675	199 966	158 369	185 820	186 485
Costs for non-economic activities (in thousands of BGN)	160 844	184 989	198 952	152 712	173 514	196 363
Fixed assets (in thousands of BGN)	82 969	64 723	119 551	99 987	91 105	84 653
Employed (number)	7 289	5 985	7 224	5 968	6 079	6 444
Employees (number)	7 070	4 995	7 024	5 786	5 866	6 280

Table 2: Indicators on not for profit enterprises, which identified themselves as social for the period 2012-2017
(Source: for 2012-2013 National database of MLSP for social enterprises in Bulgaria,
Availabe online at: http://seconomy.mlsp.government.bg/db/bg/nsi
for 2014-2017 NSI data provided to the authors as a paid service
Note: Data for social enterprises for 2017 are the latest NSI data)

The data in Table 2 shows that after 2014 the number of not for profit enterprises, which identified themselves as social decreases. The values of the financial indicators change in different directions during the period 2012-2017. The same is observed in terms of the number of employed and employees.

4. SWOT ANALYSIS OF THE ACTIVITY OF SOCIAL ENTERPRISES IN BULGARIA
In Table 3 the results of the SWOT analysis of the activity of social enterprises in Bulgaria are presented.

Strengths	Weaknesses
• Cooperation with the organisations of employers and trade unions, as well as with other control bodies on the protection of the rights of workers and the prevention in ensuring safe working conditions. • Coordination between the social assistance system and the system of active labour market programmes, in order to foster social reintegration of persons with disabilities. • Established and functioning social services network to ensure social inclusion for the most vulnerable groups. • Protective mechanisms built to support the most vulnerable groups. • Established collaboration with other non-profit institutions and organisations to improve policies and address challenges. • Capacity and experience gained in the mobilisation and use of resources from the European funds in support of labour market policies and social entrepreneurship.	• Slow increase in the number of newly opened vacancies in social enterprises for people with disabilities. • Limited labor demand in underdeveloped border regions. • Limited financial resources from the State budget for implementation of the policy of promoting social entrepreneurship. • The presence of a relatively large proportion vulnerable groups of the population, including people with disabilities in need of assistance to meet basic life needs. • Insufficient integration of social and health activities in the provision of services to a large number of people in need. • The steadily increasing number of caregivers as a result of demographic aging processes. • Difficulties in introducing an integrated approach in providing cross-sectoral services and promoting interoperability between systems. • Insufficient sector of social services and social entrepreneurship. • Low level of cooperation and interaction with other social enterprises at home and abroad, with representatives of the State and municipal administration, associations of social enterprises and professional organisations. • Insufficient capacity in the social services system and insufficient planning of the needs of social services at regional and local level. • Insufficient sustainable financing of services provided by social enterprises, which are not state delegated activities, revealed with funds under the Operational Programme "Human resources development". • Access to finance the activities of the social enterprise. • Lack of a legally regulated legal framework related to the definition of social enterprises in order to properly target policies in the field. • Prevalence of social enterprises providing social services (passive). • Problems encountered in the process of the activity of social enterprises: material base, administrative activities, personnel, equipment; preferences related to the supply of the products of social enterprises on the market; • Lack of well trained and motivated personnel working in social enterprises and willing to do the work in them.
Opportunities	**Threats**
• Implemented and continuously improving regulations is to promote social entrepreneurship, social inclusion and improving the effectiveness of the systems for social services. • Development of economic sectors with the potential to create jobs. • Improvement of national legislation in order to improve the access of employers-social entrepreneurs and job seekers, persons with disabilities to mediation employment services. • Development of policies for promoting employment and adult education, aimed at disadvantaged groups and the border regions. • Development of intermediary services on employment, including to reach out to people with disabilities. • Implementation of schemes in HRD OP for the period 2014-2020. • Extending the network of supportive services. • Capacity development at the local level to support the implementation of reform in the field of social entrepreneurship and social services. • Development of integrated services. • Development of the social economy sector. • Membership of the social enterprise Association (Association) of social enterprises; • Cooperation with institutions and organisations, which support social enterprises. • Cooperation with other social enterprises in the country and abroad. • Development of social entrepreneurship in the direction of the active engagement of target groups in the process. • Training and motivation of the people working in social enterprises and to those who are willing to do the work in them.	• A high number of unemployed persons with disabilities, total for the country and for the border regions, including long-term unemployed. • High number of inactive persons with disabilities, including discouraged. • Increasing the share of people with disabilities at risk of poverty and social exclusion. • The growing demand for services to care for the most vulnerable, which puts to the test the system of social services and necessitates the application of flexible and innovative approaches in this field. • Pressure on the pension system and support systems. • Negative demographic change and aging of the population.

Table 3: SWOT analysis of the activity of social enterprises in Bulgaria
(Source: Results of the analysis wich was carried out by one of the authors (Rayna Dimitrova) in 2018 under the project "SOCIAL AGRI-ENTREPRENEURSHIP FOR PEOPLE WITH DISABILITIES IN THE CROSSBORDER AREA", Project acronym: AGRI-ABILITY, Priority Axis: Social Inclusion, Investment Priorities: 9c, funded under European Territorial Cooperation Interreg), the "Greece-Bulgaria 2014-2020" Cooperation Program.European Territorial Cooperation (Interreg), Cooperation Programme "Greece-Bulgaria 2014-2020")

The effects of the operation of social enterprise can be analysed in the following directions:
1) In the process of implementation of the activities of the enterprise, if the employment of persons from unequal social groups is ensured.
2) When using the results of activity in the case of manufactured products, which are provided free of charge or on preferential terms of individuals from such groups.
3) In allocating the revenue from the activity of the social enterprise, if they are used in a way which contributes to living standards and the integration of disadvantaged social position.

Important effects resulting from the establishment and functioning of the social enterprises are: economic development; creating employment and labor integration; improving the well-being of assisted target groups; qualification and retraining of labor; social sustainability; diversification of income between various activities; accumulation of funds for the implementation of social objectives; financial security; financial independence, increasing the motivation of employees in social enterprise entities for participation in economic and social life; employment of persons from vulnerable social groups. A pronounced social effect is that in the course of the main activity of the social enterprise there is a balance between seeking to make a profit and the direct support the social status of certain groups of persons-mainly persons from socially vulnerable groups who need help for their life or social status with those of other members of society. These individuals form the target group of social enterprise. It has a specific purpose of business-focused on improving the standard of living, employment, provision of services and other forms of direct support to overcome the social isolation of the relevant target group. An important feature of all social enterprises is the special symbiosis, which bear a priori between the financial viability and the ability to have a social impact. In this way, they achieve both economic, financial and social goals, bringing them even more value and value to society. These significant economic and social effects of the activities of the social undertakings determine their targeted funding from both the State and private investors. Social enterprises will receive nearly BGN 52 million within the context of the new programming period with the specific goal to increase the number of their employees, such as the number of supported enterprises should reach 300 by the end of the period. The funds will come entirely under the programme "Human Resources Development 2014-2020". Since the main objective is to increase the number of employees in this type of undertakings applicants for support under the procedure must specify the aim for the creation of new and expanding the activities of the already existing social enterprises to provide employment. Their activities should be aimed at motivating persons from vulnerable groups for inclusion in employment, their integration and training for all new recruits. Funds will be allocated for the provision of monitoring by the employer for new employees. Other activities that will be funded, are equipment and adaptation of workplaces, training for more effective management of social enterprises, as well as for social marketing and promotion of social entrepreneurship (Димитрова, 2016). Tens of billions of euros invest annually funds focused on socially oriented projects. BBR is among the shareholders of such Accelerator-SIA, with a € 1 million participation. The contribution is symbolic on the background of its capital of EUR 243 million, but gives the bank the opportunity to attract SIA to Bulgaria. This could happen if a critical mass of socially focused projects is accumulated. At present, the country does not fall on a map of investors of such funds, because there are not enough businesses that intentionally work towards public benefits (Михайлова, 2016).

5. CONCLUSION
The need to take key legislative changes to become the strategic and policy measures in national documents real mechanisms for promotion of social entrepreneurship in Bulgaria, as well as the successful development of social enterprises also requires the establishment of sustainable

partnerships between business and non-profit organisations and the public sector - partnerships in which each of these actors recognizes their role in achieving socially important social goals and is ready to invest resources for this.

The main recommendations for promoting social entrepreneurship include:
- Regulatory framework and institutions: Government policies to support social entrepreneurship initiatives; they should include state (municipal) and private structures;
- Support: State and local self-government can facilitate the process, but the initiative must come from the private sector;
- Models: The better option is for each organisation to develop social activities, albeit in a smaller scope than to rely on fewer but larger social enterprises.
- Training: Creating a system of values should start from an early age. In this way, the desire to develop social entrepreneurship will manifest itself as a necessity as a compulsory element of the business organisation. Providing training on specific programs, events, etc., in which participants can join - to receive information, experience and results in their development.
- Cooperation: State, local authorities and private producers to unite and create links to support the development of social entrepreneurship; social entrepreneurs to unite in associations by sharing experiences and ideas.

The National Policy for the Promotion of Social Enterprises should provide for specific measures which, irrespective of their nature (legal, financial, administrative must observe and achieve as a result the following principles:
1) Promotion and sustainability:
    - support for social entrepreneurship should also include the release of a public resource to support the activities of the social enterprises for dealing with social problems;
    - the planning of objectives and expected results in order to provide a public resource for the support of social enterprises should be done on the basis of a periodic assessment of the environment, taking into account the specificities of the established practices and models and their potential to work towards achieving social goals.
2) Equal treatment and reduction of administrative burdens:
    - providing a package of incentives available to all forms of social enterprises;
    - provision of fast and financially accessible administrative procedures.
3) Efficiency and Effectiveness:
    - implementation of programs and measures after needs analysis, coherence and adequacy of objectives;
    - relevance of resource input to the result obtained - Clear assessment of financial and social outcomes.
4) Coordination and decentralisation:
    - establishment of mechanisms for participation of social enterprises in the planning and evaluation of the social entrepreneurship policy at the national level;
    - creating conditions for the development of social entrepreneurship at the local level, according to the specifics and needs of the respective territory by involving the municipalities in this process (through local and regional strategies).
5) Solidarity and partnership:
    - creating conditions for interaction, consultation, open dialogue and sharing of responsibility among all stakeholders.

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STABLECOINS CLASSIFICATION AND ASSESSMENT OF RISKS

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ABSTRACT
A stablecoin is an asset recorded and transferred on a distributed ledger technology, implementing cryptography, and mirroring the value of a currency, commodity or other asset with a relatively stable price. Stablecoins can be divided into Private Collateralized, Algorithmic and Central Bank Digital Currencies. There are two types of algorithmic stablecoins – over-collateralized and seigniorage based. Over-collateralized stablecoins are a beneficial innovation in decentralized finance, as long as technical and regulatory risks are observed. Seigniorage algorithms are economically flawed and their implementation is often connected to eventual death spirals.
Keywords: *Stablecoins, Collateral, Algorithmic, DAI, Maker Protocol, UST, Terra, Luna*

1. INTRODUCTION
A decentralized cryptocurrency with a stable price is the holy grail of decentralized finance. Bitcoin proponents predict the stabilization of the price of Bitcoin with great continuity around the world, but in practice, as of 2022, the price of the first and largest cryptocurrency by market capitalization is extremely volatile. This prevents its perception as money and means of payment. That led to the emergence of stablecoins. This paper will attempt to classify the types of stablecoins and the risks associated with them. This could help the adoption of safe stablecoins. Also this classification could assist regulators in understanding the nature of different type of stablecoins and help them regulate better the sector by providing clarity. It is recommended to adopt regulation that allows different types of decentralized finance innovations to flourish.

2. COMPARISON BETWEEN STABLECOINS
A stablecoin is an asset recorded and transferred on a distributed ledger technology, implementing cryptography, and mirroring the value of a currency, commodity or other asset with a relatively stable price. The first stablecoin was initially released in 2014 under the name Realcoin, now known as USDT. It was launched by the private company Tether Limited on Bitcoin (Omni Layer Protocol). Later on, Tethers are issued on the Ethereum network as an ERC-20 token and other networks – Tron, EOS etc. Tether and other privately issued stablecoins manage to keep their peg by having cash and other real assets reserves with a ratio of at least 1:1 – they are collateralized. Currently the largest market caps stablecoins are USDT, USDC, BUSD and DAI. Tether is dominating the market with a 43% share.
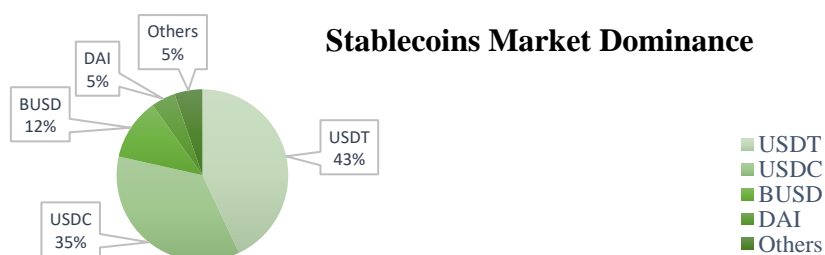
Figure 1: Stablecoins Dominance
(Source: Data from Coingecko, extracted 30/07/2022, Author Calculations)

As of July 2022, the issuing and running of price-stable cryptocurrencies is a rather unregulated activity around the world. Anti-money laundering laws compliance is pretty much the only regulatory framework that is supposed to be observed by the issuers. In the EU and the US regulatory framework is being discussed and will be implemented soon. The Markets in Crypto Assets Regulation (MiCA) of the EU draft does not take into consideration the specifics of algorithmic stablecoins – a more tailored approach should be taken towards them. Central banks are also looking into possibility of issuing their own stablecoins known as "central bank digital currencies" (CBDC). Since there are no existing CBDC-s this research will focus on existing stablecoins and their design. This is how the stablecoins can be divided into:
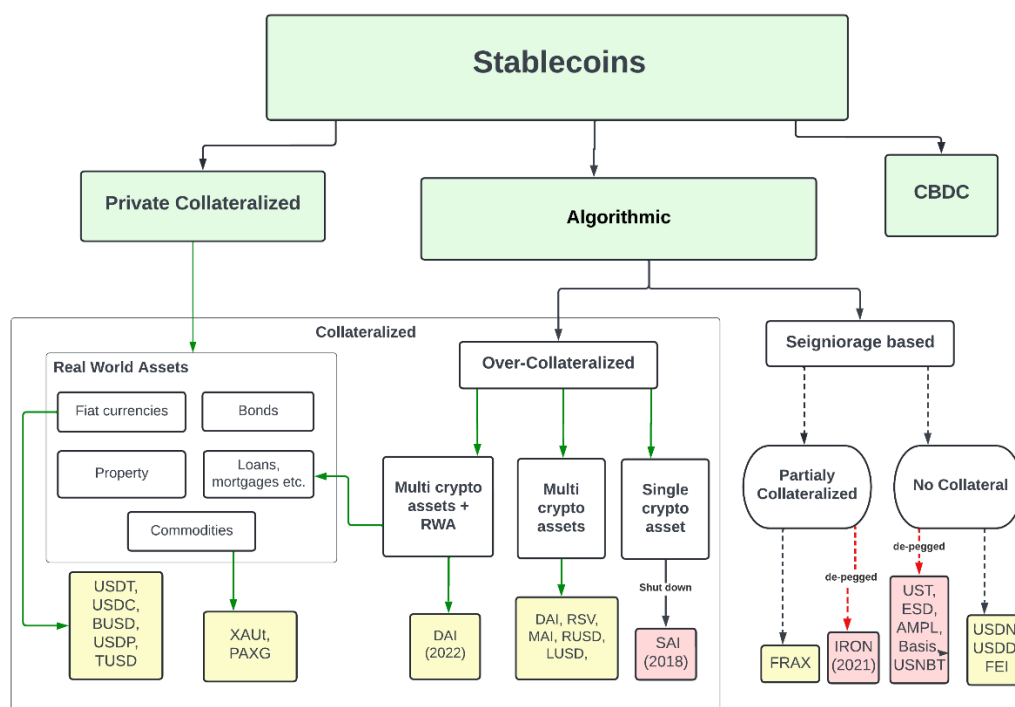
Figure 2: Type of Stablecoins according to the collateralization
(Source: Author creation using Lucid software)

Private collateralized stablecoins have some advantages over electronic money - instant transfers worldwide, transparency of payments, ability to verify each transaction by anyone, ability to be stored privately without the need for a custodian or intermediary. Their main shortcomings are related to their centralized issuer – commercial companies, which de facto are very similar to payment institutions for electronic money, but lacks regulatory control currently. The issuers promise that for every asset they mint on blockchain (Radeva, 2022, p. 2) (I. Popchev, 2021, p. 5) (Taneva, 2019, pp. 148-192) they will have collateral of at least the same amount in fiat money, securities or other certificates of deposit. For proponents of decentralization, the need for an issuer to control supply and maintain collateral is unattractive. The possibilities for errors, abuses and force majeure situations are too great. There has been a long-time trust issue about the reserves coverage of Tether and blockchain industry has been trying to come up with a real-time reserves auditable stablecoin independent of the off-chain world and regulatory means. A currency that would not trust in a centralized entity. That is how algorithmic stablecoins gained popularity. Algorithmic stablecoins are one of the greatest innovations is decentralized finance. They may be mainly divided by the mechanism they preserve their stable value. Generally there are two big groups – algorithmic stables with collateral and such without collateral.

2.1. Algorithmic over-collateralized stablecoins

Algorithmic Over-collateralized stablecoins have collateral backing exceeding the nominal value of the minted coins. Dai is the first and largest market cap example in this category. It's protocol is based on the Ethereum blockchain. In the crypto industry DAI is often considered a "over-collateralized" stablecoin and not an "algorithmic" stablecoin, as the industry considers "algo-s" those stable which have no collateral. This paper believes the right term for Dai is "algorithmic over-collateralized stablecoin" due to the nature in decision for issuance of the DAI – based on mathematical algorithm, no human decision. That is why this research labels it as an algorithmic stablecoin.

2.1.1. Issuance of new units

The issuance of new units is not managed by a "central bank", company or individual but by a system of smart contracts that are run in a decentralized manner. Like fiat money and private stablecoins algo stablecoins have no formal maximum cap. However, they are only issued when collateral is deposited in a "vault". When the collateral is returned, the issued units are destroyed. This happens automatically and independent of the identity of the requestor without a need for permission, as long as the needed collateral is provided by the one requesting the coins. The collateral is another volatile crypto asset with a high credit rating. This concept resembles the gold-dollar standard, where every new currency is backed by gold. Moreover, the algorithmic stablecoins that are minted are a form of secured credit. Whenever a person wishes to receive newly minted coins, they must provide collateral in another crypto asset. Initially, the first algo stable DAI accepted only Ether, but today there are new and new types of collateral being accepted, including other stable crypto assets. DAI is overcollateralized ranging between 101 to 185 % (according to the risk of the collateral)[1]. Experimentally, Dai is also starting to accept collateral in real-world assets, which take up about 1% of all collateral (Zach, 2022). The difference between the collateral and the minted coins serves as a cushioning buffer in the event of a fall of the collateral price.

$$\text{Collateralization Ratio} = \frac{\text{Collateral Amount x Collateral Price}}{\text{Generated Stablecoins} \times 100}$$

Formula 1: Collateralization Ratio
(Source: Maker DAO's Github[2])

To some extent , the mechanism resembles repo transactions, where the borrower is financed against interest. In repo transactions, the lender grants a credit line to the borrower in the form of a purchase of securities with an arrangement for repurchase at a higher price. The loan is secured by securities of a higher value than the cash received. If the borrower does not repay the amount received plus interest, the lender has the right to liquidate / sell the securities and be compensated with their value. The two transactions are also similar in that the borrower is exposed to the risk of a change in the market price of the securities he holds, respectively ETH with Dai. The mechanism by which the transaction happens is not just an automated process, but also a completely decentralized one. The smart contract doesn't just lend money to the borrower, it instructs its own "bank" to issue newly created stable crypto assets and send them to the borrower. The borrower, on the other hand, decides whether to enter into a relationship with the smart contract. The "bank" is simply a smart contract that can issue new cryptoassets.

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[1] https://oasis.app/borrow
[2] https://github.com/makerdao/community/blob/master/faqs/liquidation.md

It issues new units on demand and has no right to refuse to issue as many monetary units as it has security for. On the other hand, in the relationship between MakerDAO and other crypto protocols (smart contracts) for financing (credit), earning interest, currency exchange such as Compound, Aave, Curve, 1inch, Uniswap, Yearn finance and others - MakerDAO can be watched as the central bank issuing the new crypto units that enter the circulation of the other protocols. The mechanism allows the issuance of new loans in the form of a stable cryptocurrency without an intermediary and without the need to trust the borrower. This happens thanks to communicating smart contracts that manage and execute the entire process. Each loan is an individual smart contract that communicates through an algorithm with the Protocol's "bank". These individual smart contracts (safes or vaults) are numbered and are called Collateralized Debt Position (CDP). The status of the smart contract responsible for the Dai issuance and all Dai transactions can be seen at any time by anyone by simply searching for the following address (in Etherscan): 0x6B175474E89094C44Da98b954EedeAC495 271d0F. Since the creation of Dai, more than 14 million transfers have been registered. Nearly half a million addresses on the Ethereum blockchain own 6.8 billion DAI in circulation[3].

2.1.2. DAO governance
Since the whole process is autonomously run by an algorithm on a blockchain and not humans and companies it is basically a Decentralized Autonomous Organization (DAO). We can imagine the protocol like a decentralized bank owned by shareholders. The share is basically another crypto asset with voting rights and volatile price. In the case of DAI, the Maker Protocol has a native coin Maker (MKR). When there are profits the bank buys back the share and thus increases its price – resulting in capital gains for the shareholders. (Initially 1 million MKR were created, and today over 22 thousand have already been burned or over 2%). Shareholders can votes on interest rates, changes to the protocol, new types of collateral, and other matters. The weight of votes is determined in proportion to the volume of shares held by the voter. Over 86 thousand addresses own MKR, however the first top 100 addresses hold 83% of all MKR in circulation.

2.1.3 How is the peg sustained?
We mentioned that the collateral is locked in the smart contract or the so-called safe (vault) until the loan plus the interest is repaid. But what happens to the collateral when its market price falls? In order to maintain the full collateral of every single unit issued, any safe whose coverage falls (*below the standards set by MKR holders in the case of DAI*) is liquidated through automated auctions. The liquidation price is determined by the collateral amount and and liquidation ratio by the following formula:

$$\text{Liquidation Price} = \frac{\text{Generated Stablecoins} * \text{Liquidation Ratio}}{\text{Amount of Collateral}}$$

Formula 2: Liquidation Price
(Source: Maker DAO's Github)

Liquidators buy the collateral at an auction at the highest bid price. The sale price is paid by the winner of the auction to the safe and the coverage of the issued stablecoins is restored. Auction participants have an economic incentive to initiate the auction and buy at the lowest possible market price, making a profit on the difference. An example of large liquidations caused by a drop in the price of Ether can be traced on April 18th, 2021. According to Statista, on April 16th, the ETH price reached its peak of $2,538, with the following days falling: on April 17th,

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[3] https://etherscan.io/token/0x6b175474e89094c44da98b954eedeac495271d0f

it was $2,438 , and on April 18th it is $2,374. Here is an example that can be searched on the Ethereum blockchain (etherscan.io is a search engine that gives access to all transactions). Search for the following hash: 0xb1d644ba47a7b29359fcb7caad29d8df4e495d33bb5ffb68 bade88e72e771af7. With this transaction at block 12260840, the Liquidator paid back 2,935,983 Dai to Aave Protocol V2 by selling off 1,344 Ether held in the smart contract (0x645E93859eC63aBe0c7fe74f17c07c236ee58799). The sale was made by swapping 1,310 Ether for 2,938,403 USDC on the Sushiswap decentralized exchange. According to Etherscan, on the day of the transaction, the price of Ether was $2,240. Different exchanges have different volume and order book, therefore a difference of 5-6% is not surprising given the high volatility and therefore we encounter different historical statistics On June 13th, 2022 alone, Maker Protocol has held 182 auctions and burned 35 million DAI [4]. In the last year, a total of 1,330 liquidations were carried out and collateral for $341m was generated, paying off debt for $305m. 11.7% penalties were collected from the liquidations - $35 million, which are revenues for the protocol and the DAO [5]. In case the collateral is not sufficient to cover the debt, the buffer is used. If it is not enough, a Debt Auction is launched, which issues share tokens and uses it to purchase stablecoin from the market. Subsequently, once the balance in the system is restored, the Protocol automatically destroys the excess share units. The destruction is done by means of a "self-destruct" function - an operation at the Ethereum virtual machine level, using negative gas, to clear data and free up space on the blockchain - stopping part of the work of the smart contract. It differs from the "burn" command, where tokens are "burned" by sending them to an address with no private keys available. Price Oracles are important for the ecosystem. They provide real-time information on the prices of the collateral in each safe. This is how the moment to start a liquidation by auction is recognized. The stability of Over-Collateralized stablecoins can be preserved as long as the Protocol has enough time to launch and execute the necessary liquidations. In case of instant drop of ¾ of the value of a 130% collateralized CDP there would not be enough time for the liquidation to take place and the coins could loose their peg. This is the reason why stable cryptocurrencies – USDC and others – have been added to the collateral basket of DAI. Initially, the collateral was only ETH**.** Currently, 50% of DAI issued are backed by USDC [6]**.** This could become a problem if the company behind the USDC decides to freeze specific USDC units and make their use impossible. Unlike public blockchain decentralized currencies like bitcoin – USDC and USDT issuers have the ability and authority to freeze units. This is a risk that needs to be monitored as it is likely to increase as more regulations and obligations are imposed on stablecoin issuers to prevent crime. Over-collateralized algorithmic stablecoins have been tested numerous times. Dai is the first algorithmic stablecoin that functions for a relatively long period of time with numerous stress tests. A major smart contract crash spawned by an oracle crisis was seen around May 2020 at Chainlink [7]. Many projects had a hard time, but eventually Dai pulled itself together and it was a successful stress test. As of 10/05/2022, Dai underwent a major test with the drop of a lot of its collaterals prices. With large fluctuations in the crypto market on 09/05/2022, Dai fully maintained its peg, while UST value dropped to $0.6 and later on to nearly zero. This is also due to Dai 's improved basket of diversified collateral [8]compared to UST. Market price is not a sufficient argument as to whether a stablecoin is stable or not. Exchange prices are maintained by professional market makers, who provide liquidity (create multiple buy and sell orders on both sides of the order book in a given range). If the market maker is proficient - it doesn't matter if there is collateral at all for the given token, as long as

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[4] https://twitter.com/MakerDAO/status/1536770526064037888
[5] https://maker.blockanalitica.com/liquidations/
[6] https://daistats.com/#/overview
[7] https://www.longhash.com/en/news/3339/MakerDAO%E2%80%99s-in-Trouble-%E2%80%94-And-It-Could-Shake-Up-DeFi
[8] https://daistats.com/#/collateral

there is enough liquidity. In order to judge whether a given stablecoin is of high quality, the mechanism of functioning of the collateral in all scenarios is important. To create the greatest security, it is desirable that the collateral be highly diversified, as it is with Dai .

2.2. Algorithmic seigniorage stablecoins

Seigniorage based algorithmic stablecoins emerge mainly after Robert Sam's 2014 article - "A Note on Cryptocurrency Stabilisation: Seigniorage Shares". The word "seigniorage" translates into the profit generated from the face value minus the costs associated with the production of the new monetary units. The idea behind his work is to stabilize price by providing an elastic supply of two assets (Sams, 2015, p. 3). One asset with a volatile price and another with a stable price. When the stablecoin value decreases and increases the quantity of stablecoins is changed proportionally to the value. "The idea is that an X% change in coin price, followed by an X% change in coin supply, will return coin price to its initial value.." (Sams, 2015, p. 2). This research believes that the system creates a vicious cycle in the long-run. The system of seigniorage can only be maintained under the assumption there would be a never-ending demand for the share token, which in reality might not be the case. The demand for the share might be increasing or preserved in the case the market believes the price of the share would go up or there is some other usecase for it. In the contrary scenario – if the market believes the share is overpriced – no one would want to keep the share even if it is sold at a discount *(Freeman) (Coinsider)*. This eventually can drag both tokens to a death spiral, *as we observed the case with UST in May 2022.*

2.2.1. Issuance of new units and preserving the peg

The integral part of the seigniorage system are a stablecoin and a "share" token. When the stablecoins are minted the share are burned and the opposite. For every share in circulation the Protocols allows the minting of the equal amount of stablecoins. What is important to remember is that there is no real backing in the shape of collateral – the share token is not backing the stablecoin – there is only manipulation of the quanity of both tokens via burning one agaist minting the other. In the case of Terra Protocol these are UST and Luna. Both tokens were developed by the same group – Terra and lie on the Terra blockchain (Evan Kereiakes, 2019). The Anchor protocol (interest bearing deposit service, that provided a 20% fixed yield on UST without a time lock) is a supplimentary part of the protocol, which incentivized the large adoption and thus production of UST via extremly high unhealthy yields. This feature is not an integral part of a seigniorage system. In that case, it led to making the system more inflated and thus more fragile. The demand for UST is not constant and leads to fluctuations in the price of UST on exchanges. When more people prefer other stablecoins the price of UST can go below $1. If they want to use the Terra apps which promote UST then the price of UST can go above $1 (Terra). In Figure 3 we see 3 alternative scenarios. Scenario 1 and 2 are how the protocol is meant to recover the peg of $1 when demand and supply for UST are increased and decreased. In the first scenario UST demand increases from D0 to D1. This drives the price higher from P0 to P1. Luna is then burned, which drives Luna price higer from P0 to P1. The respective amount of UST is minted, increasing the supply from S0 to S1, which creates equilibrium in P2 back at $1. In the alternative situation where UST demand decreases (Scenario 2) the price goes down from P0 to P1 or $0.9. To bring back the price of UST, UST is burned and Luna is minted. Since the supply of UST is decreased to S1, the new equilibrium price goes back up to P2. Luna supply moves from S0 to S1 and the price of Luna goes down from P0 to P1 (from $40 to $30 – numbers are not realistic but just an example). This is how the system is supposed to mint and burn token and simultanuosly keep the peg. What happens in reality though is Scenario 3. Luna demand is significantly increased and the price ballons from $30 to $50. The investors hold Luna initially and UST supply stays the same.

In the third phase the investors change their feeling about Luna and their demand significantly decreases driving the price down from \$40 to \$20. They start burning their Luna and minting UST. Flocking investors to UST mint new UST and increase its supply
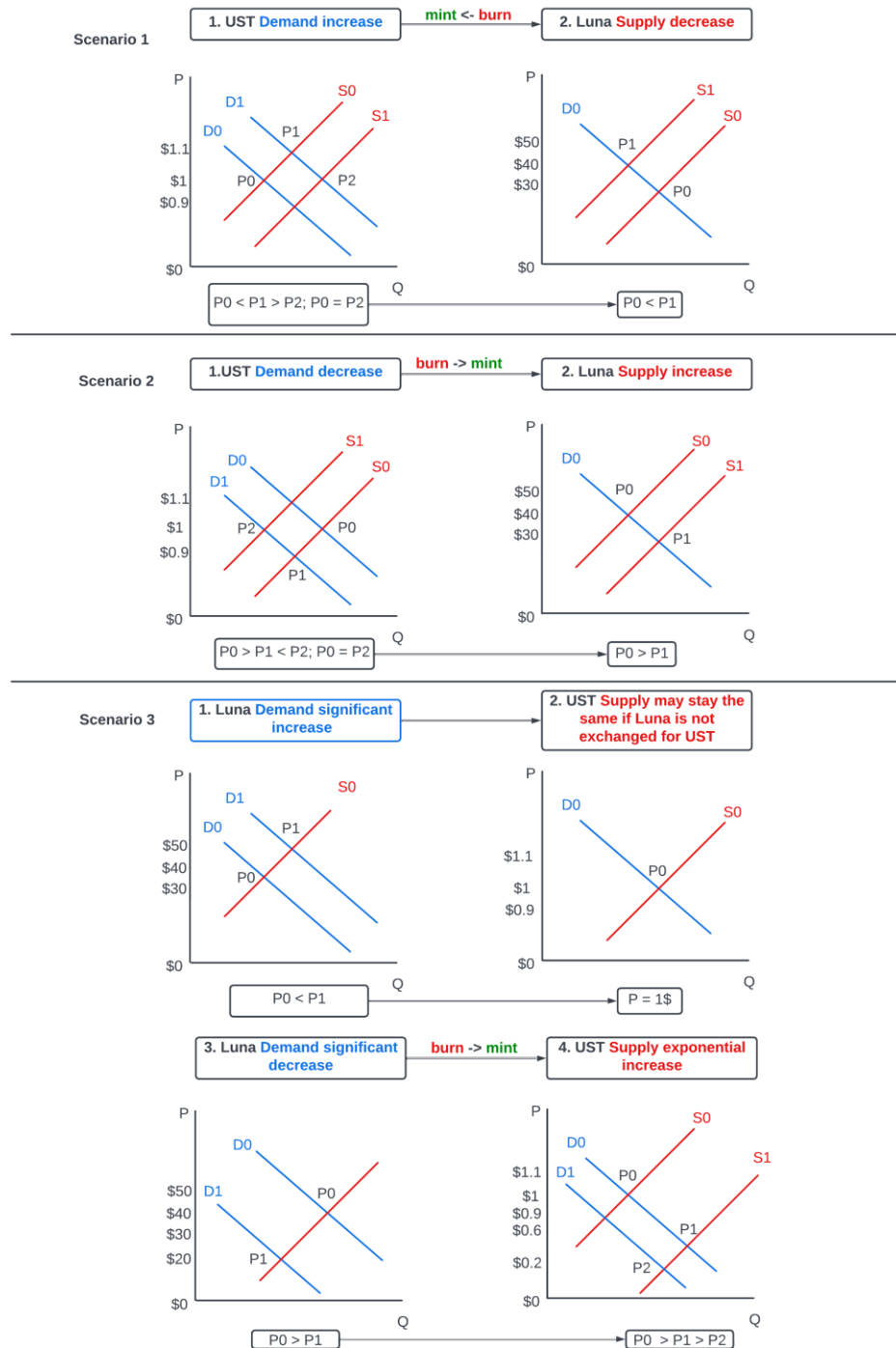
*Figure 3: Luna and UST Supply and Demand
(Source: Author creation using Lucid software)*

exponentially from S0 to S1 driving down the equilibrium price to \$0.6 and creating a de-peg. The demand for the de-pegged currency goes down pushing the price of the stablecoin even further to \$.20 and eventually to 0.

On Figure 6 we can observe how the share token (Luna) amount suddenly expanded to meet the conversion of the stablecoin (UST), which suddenly shrinks once the peg breaks. Once the market cap of the stablecoin (UST) becomes larger than the share (Luna) market cap (Figure 4) - the death spiral is in play for both tokens and there is no return. *UST Market cap cannot shrink as fast as the Luna Price (Figure 5).*
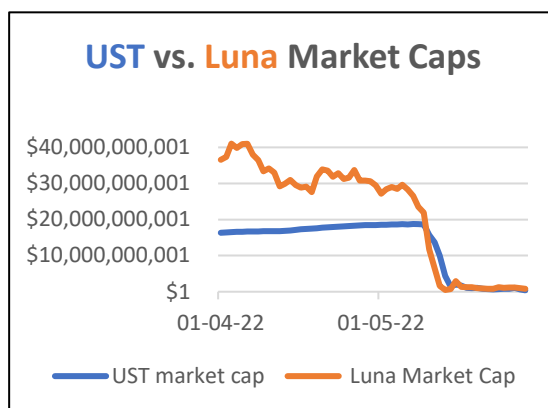
Figure 4: UST vs. Luna Market Cap
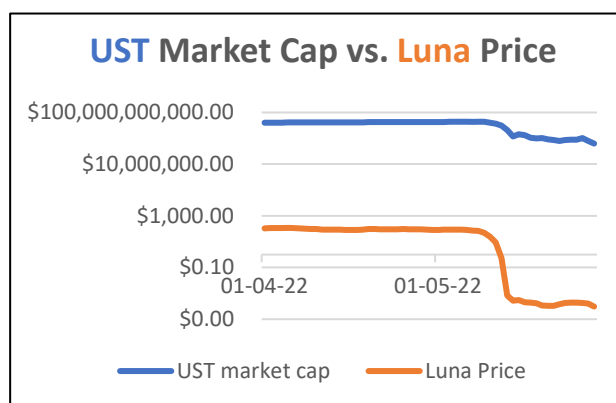
Figure 5: UST Market Cap vs. Luna Price (log. scale)
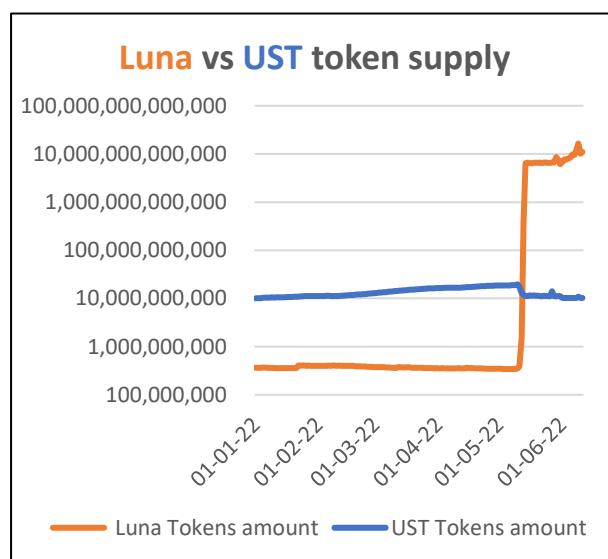
Figure 6: Luna vs. UST token supply (log. scale)
(Source: Historical prices from Coingecko. Author calculations)
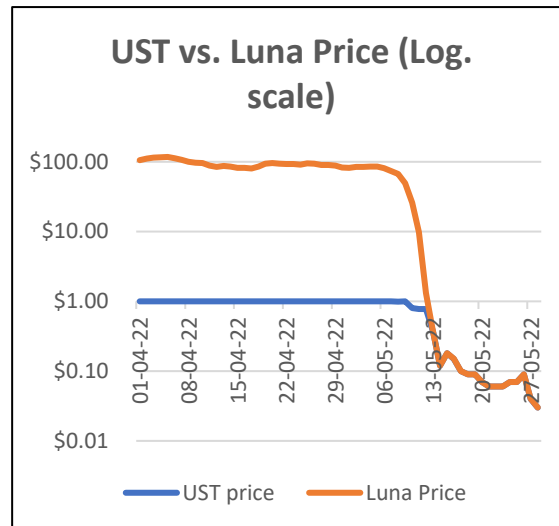
Figure 7: UST vs. Luna Price (log. scale)
(Source: Historical prices from Coingecko. Author calculations)

The current research shares the opinion of Nevin Freeman (Freeman) and Coinsider (Coinsider), who believe algorithmic stablecoins without collateral can thrive for a short period of time in a controlled atmosphere of balanced supply and demand. Once there are big discrepancies between the demand and supply theses systems tend to fail. This has been proven more than once. Other such examples are IRON, ESD, AMPL and USNBT collapses.

3. RISKS ASSOCIATED WITH STABLECOINS
The current research finds the highest risks in the stablecoins sector are connected with algorithmic stablecoins and their economical flawed model which can lead to a vicous cycle. Private collateralized stablecoin issuers are also incentivized to print more coins that their collateral, but if control is in place – this should happen rarely. For private collateralized stablecoins the highest risk are technical exploits on bridges and mistakes and malicious actions on their financial audits. Based on all previous observation we believe the following risks exist to the functioning of stablecoins:

RISKS		Private Collateralized	Algo Over-Collateralized	Algo Seigniorage
1. Technical Risk	**Layer 1 issues**	low	medium	medium
	Bridge hacks and exploits	high	high	high
	Smart contract, Oracles	low	high	very high
2. Regulatory	**Freezing of assets by Issuer**	low	medium	N/A
	Legal Uncertainty	low	high	very high
3. Financial Audit	**Mistakes**	high	very low	low
	Malicious action	high	low	low
4. Ecological	**PoW resource consuming**	low-high	high	low-high
	Collateral Value drop	low	high	N/A
	Lack of liquidity	low	medium	N/A
5. Market	**Lack of demand for shares**	N/A	N/A	very high
6. Criminal usage of the stablecoin	**Sanctioned country**	low	high	very high
	Money-Launderying	low	low	low
	Financing crimes	medium	low	low
7. Economical model	**Bad incentives for players**	medium	low	very high

Table 1: Risks for the functioning of the Stablecoin
(Source: Author)

For algorithmic collateralized stablecoins the highest risks are technical - smart contract, bridge mistakes and exploits and their legal status uncertainty.

4. CONCLUSION

The research finds stablecoins are a positive innovation that can help the adoption of decentralized governance via reduction of unnecessary intermediaries in the financial sector. There are numerous risk factors that need to be observed when generating and distributing stablecoins. The risks associated with seigniorage stablecoins tip the scales in favour of creating regulatory framework that will focus on allowing the existence of over-collateralized algorithmic stablecoin and private collateralized stablecoins. When it comes to seigniorage stablecoins we are in favour of forbidding such protocols to brand themselves as "stablecoins". Private stablecoins and over-collateralized algorithmic stablecoins have their own risks but both deserve their place in the future of decentralized finance.

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ECONOMETRIC ESTMATION OF THE INFLUENCE OF THE CIRCULAR ECONOMY ON THE SOCIO-ECONOMIC DEVELOPMENT OF THE EU COUNTRIES

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ABSTRACT

The article evaluates the dependencies and causality between socio-economic development and the circular economy in the countries of the European Union for the period 2010-2019. The indicators of the circular economy are recycling rate of municipal waste, generation of municipal waste per capita, circular material use rate and trade in recyclable raw materials. Socio-economic development is represented by two indicators, namely the Human Development Index and gross domestic product per capita. The dependencies between indicators are estimated using panel regression models with fixed and random effects. The causality of the selected variables is tested using the Dumitrescu–Hurlin causality test.
Keywords: *causality, circular economy, panel data, socio-economic development*

1. INTRODUCTION

In recent years, the concept of a circular economy has gained increasing public significance, considering the role it has on both sustainable economic development and the environment. The transition to the circular economy is a necessary step, as intensive use of non-renewable natural resources is considered worldwide, which leads to a number of environmental consequences. At the core of the circular economy concept, it is the principle of the maximum efficient use of resources and minimizing the negative impact on the environment, which is observed at the individual stages of the product life cycle. The circular economy has been the subject of research since the 1970s, when Bouding (1966) considered an economic model with circular flows of materials and concluded that the economy and the environment should coexst in balance because of the limitation of natural resources. The term "circular economy" was first introduced by Pearce and Turner (1990), who criticized the linear economic model because of the negative consequences it had on the environment. This thesis has been also advocated by a number of other authors (Nassar & Tvaronavičienė, 2021), (Andryeyeva et al., 2021), (Marino & Pariso, 2021), (Androniceanu, 2019), according to whom the linear model is ineffective and unsustainable due to the limited natural resources and increasing environmental pollution. In contrast to the linear economic model, circular economy systems preserve the added value of products as long as possible in order to eliminate the generation of waste. The specific characteristics of the circular economy were presented by Stahel and Reday (1976), who envisioned it as a closed loop with circulating resources, thus achieving resource efficiency, creating new jobs, and reducing waste generated in the environment. At the core of the circular economy, it is the reuse of resources, as well as the minimization of consumption and costs, with the aim of achieving maximum economic and social benefits for society. In the beginning, the concept of the circular economy was based on the 3R principle (reduce, reuse, recycle), and the reduction mainly refered to reducing the amount of natural resources used, unnecessary

production and consumption, but without affecting the quality of human life. The concept has subsequently been upgraded to the 6R principle – reduce, reuse, recycle, redesign, remanufacture, and recover (Jawahir, I.S.; Bradley, R. 2016) and the presented principles consider the circular economy primarily from the point of view of production processes, without taking into account the need to change consumer behaviour and government policies. The latter are included in the 9R model, in which the principles of the circular economy are presented in a gradation as follows: refuse (preventing the use of raw materials), reduce (reducing the use of raw materials), reuse (product reuse – second-hand, sharing of products), repair (maintenance and repair), refurbish (refurbishing a product), remanufacture (creating new products from old products), repurpose (product reuse for a different purpose), recycle (processing and reuse of materials), recover energy (incineration of residual flows) (Van Buren N, Demmers M, Van der Heijden R, Witlox F., 2016). The transition from a linear economic model to a circular economy is promoted by a number of Europe-wide policies for the purpose of achieving sustainable economic development. In this regard, a number of measures have been taken, including legislative changes in relation to preventing the generation of waste and critical raw materials, as well as improving the monitoring of circular economy indicators in the EU. In 2015, the European Commission adopted the Circular Economy Action Plan (2015), which contains a number of measures whose main objectives are related to increasing the socio-economic well-being of society, environmental protection, increasing competitiveness and achieving sustainable growth of the European economy. The aim of the research is to study the dependencies and causality between socio-economic development and the circular economy in the countries of the European Union for the period 2010-2019. The indicators that characterise socio-economic development are the human development index (HDI) and the gross domestic product per capita (GDP growth), and the indicators of the circular economy – recycling rate of municipal waste (RRMW), generation of municipal waste per capita (GMWpc), circular material use rate (CMUR) and trade in recyclable raw materials (TRRM). The information support for the analysis is based on official statistical data from Eurostat. The structure of the present work is as follows: after the introduction, the second section presents an overview of research on the issue under consideration; the third section presents main methodological aspects of unit root tests and main results of the econometric study of the dependencies between indicators of socio-economic development and indicators of circular economy; the fourth section presents the results of the study of the causality between socio-economic development and the circular economy and the final section includes the summarised results of the conducted empirical research.

2. LITERATURE REVIEW

The impact of circular economy indicators on the socio-economic development of the Community countries is the area of research by many authors. In their scientific studies, different time periods and groups of EU countries are covered, as well as indicators representing different aspects of the circular economy, but the main results are identical – the circular economy has a positive influence on economic growth. Chen and Pao (2022) conduct a study covering 25 EU countries and the period 2010-2018. The results show that waste recycling rates and investments related to circular economy have a positive effect on GDP, while material recycling has a negative effect. Georgescu et al. (2022) on the basis of fixed effects regression models conclude that the recycling rate of municipal waste, research and development expenditure, and municipal waste generated per capita have a positive effect on economic development in EU-28 countries in the period 2000-2018. Busu (2019) and Busu and Trica (2019) find that the circular economy generates sustainable economic growth across the EU, and with a 30% increase in resource productivity by 2030, GDP will grow by nearly 1%. The authors reach similar results in another study: investing in recycling infrastructure and

innovative resources is essential to protect the environment and achieve sustainable economic growth (Trica, Banacu & Busu, 2019). Hysa, Kruja, Rehman and Laurenti (2020) find the correlation between indicators for circular economy and socio-economic development in the countries of the European Union for the period 2000-2017. The results of the econometric models show a strong positive relationship, highlighting the crucial role of sustainability, innovation and investment in zero-waste initiatives in promoting economic growth. Grdic, Nizic and Rudan (2020) find that the application of the circular economy concept can provide economic growth in EU countries, while reducing the use of natural resources and guaranteeing greater environmental protection. In a significant number of scientific works, the causality among economic growth, the human development index and indicators of the circular economy are the object of research. For instance, Ferrante and Germani (2020), based on the Dumitrescu–Hurlin causality test, establish a two-way causality between the circular economy on the one hand, and the human development index, the population at risk of poverty and social exclusion on the other. It has also been found that the circular economy affects unemployment, but not vice versa. The availability of two-way Granger causality between municipal solid waste generation indicator and economic growth indicator is established by Magazzino et al. (2020) in a study of the environmental Kuznets curve in Switzerland for the period 1990-2017. Gardiner and Hajek (2020) establish a short-term and long-term two-way causality between municipal waste generation per capita and economic growth in EU countries. There is also a two-way causality between waste generation, thermal energy and research and development expenditure. Chen and Pao (2022) find that, in the short term, increased material recycling leads to a reduction in waste generation, and an increase in waste generation leads to an increase in circular economy investment. Economic growth promotes a circular economy in the short term, but not vice versa. In the long term, there is a two-way causality between GDP and the circular economy indicators studied. Georgescu et al. (2022) examine the causality between the circular economy and economic development in the EU countries for the period 2000-2018 by Dumitrescu–Hurlin causality test. The results show a two-way causality between economic growth and recycling rate of municipal waste, as well as between generation of municipal waste and recycling rate of municipal waste. A one-way causality is established from GDP per capita to research and development expenditure and from GDP per capita to generation of municipal waste per capita.

3. UNIT ROOT TESTS IN PANEL DATA RESEARCH

Over the last few decades, more and more econometric studies have been based on the use of panel data, in which the stationarity of the output variables is often the object of study. In the beginning, a database with a limited number of time periods (usually T covers 4 or 5 observations) with a sufficiently large number of cross-sectional units (N) that can be represented as households, enterprises, regions, countries, etc., have traditionally been used. With the development of information technology, which has led to the widespread use of online electronic resources, the output data sets refer to increasingly large volumes both in terms of time periods and cross-sectional units. All this, together with the emergence of contemporary trends in the analysis of statistical information such as big data and data science, determine the need to develop new indicators for testing panel unit roots.

3.1. A brief description of basic unit root tests in panel data analysis

An extensive review and comparative analysis of trends in the development of indicators that can successfully test stationarity, respectively non-stationarity in the studied indicators in panel data analysis was carried out by Barbieri (Barbieri, 2006). From the point of view of the presumption of dependence or independence between cross-sectional units, there are two main strands (generations) in the development of unit root verification criteria.

The first strand is based on the presumption of cross-sectional independence between units, while in the second strand, the hypothesis of dependence between cross-sectional units is asserted.

3.1.1. The first generation of panel unit root tests.
In the first generation, two main groups are distinguished – criteria for checking for the presence of a unit root (i.e. criteria for non-stationarity) and criteria for stationarity. The group of non-stationarity criteria includes: the Levin and Lin criteria (Levin, 1993); Levin, Lin and Chu or LLC test (Levin A. C., 2002); Im, Pesaran and Shin or IPS test (Im K.S., 2003) and criteria based on the Fisher distribution (modifications of the Augmented Dickey and Fuller (ADF) test) and the Phillips-Perron (PP) criterion, adapted by Maddala and Wu (Maddala, 1999) and Choi (Choi, 2001). The stationarity criteria group includes the KPSS criterion (Kwiatkowski, 1992), adapted for the needs of panel data analysis by Choi (Choi, 2001) and Hadri's criterion (Hadri, 2000). Here, it is briefly considered the essence of these criteria, which are used to check for non-stationarity, respectively stationarity in the indicators of the circular economy and the socio-economic development of the European Union countries, covered in the present study. The null hypothesis for LLC is for the presence of a common unit root, while with the null hypothesis under IPS and the criteria based on the Fisher distribution postulate that individual unit roots are available at all cross-sectional units (series). The alternative hypothesis under LLC states homogeneity, i.e. stationarity is observed in all series, while for IPS and criteria based on the Fisher distribution in individual units a unit root may exist and for others – not, i.e. there is heterogeneity. With the null hypothesis for KPSS and Hadri tests, it is stated that there is stationarity in all cross-sectional units, i.e. there is no unit root in the studied time series composed of all panel units, while the alternative hypothesis is for homogeneity, i.e. there is a common unit root. The main advantage of the first generation tests is that they can be applied to unbalanced panels where missing data exist, but for LLC and IPS tests additional simulations are required. The advantages of tests adapted using the Fisher distribution include the possibility to apply them to almost any standard unit root test and the possibility of using different lag orders for the individual (for individual cross-sectional units) ADF criteria. The main advantages of the stationarity criteria are that the moments of the asymptotic distributions are obtained directly and are correct, and the risks of falsely rejecting the null hypothesis are minimal, because when calculating their empirical values, both the number of time periods T and the number of cross-sectional units N are asymptotically taken into account. However, it has to be kept in mind that under certain circumstances, including small values of T, with Hadri's criterion the probability of falsely rejecting the null hypothesis of stationarity, when it is valid, is high (Hlouskova J. and Wagner, 2006). Disadvantages of the criteria based on modifications using the Fisher distribution include the problems with unfounded rejection of the null hypothesis in the presence of serial correlation in the residual elements and the fact that the p-value is determined using Monte Carlo simulations. The main disadvantages of LLC and IPS are several. Both criteria are based on the assumption of the same deterministic components in all units, these criteria require a large enough number of cross-sectional units for their empirical values to be correct, and their theoretical values are sensitive to the lag order in the regression equations with which the individual ADFs are calculated. All non-stationarity criteria from this generation suffer from a loss of power when the influence of time trend is also taken into account in the models. Of the three criteria, IPS is the most powerful, and in the presence of cross-sectional correlation, Fisher's criteria are more powerful than LLC. By combining unit root tests and stationarity tests, a more efficient assessment of the stationarity of the output data is achieved in panel studies.

Three situations are possible: clearly defining the time series that appear to be stationary, clearly defining the time series that have a unit root, and defining the time series for which it is not possible to determine whether they are stationary or non-stationary.

3.1.2. The second generation of panel unit root tests.
In the second strand (generation), in which the hypothesis of dependence between cross-sectional units is asserted, two approaches are applied: an approach to apply certain restrictions on the covariance matrix with the residual elements used by Chang (Chang, 2002, 2004) and an approach using the factor structure applied by Bai and Ng (Bai, 2004) by means of the PANIC test, Moon and Perron (Moon, 2004), Pesaran (Pesaran, 2007) through the CIPS test, etc. From the second strand, only the PANIC and CIPS tests included in the factor structure approach are used in the present study. With the null hypothesis, both criteria postulate the existence of a unit root for all cross-sectional units, and the alternative hypotheses are heterogeneous. Pesaran (2007) proposes the cross-sectionally augmented Dickey-Fuller (CADF) criterion, which is calculated as the average of the lag levels and the first successive differences in terms of regression equations for the individual cross-sectional units. Along with this, he also presents a cross-sectionally augmented IPS (CIPS) criterion, which is calculated as the average value of the individual CADF-test results. In constructing the tests, the hypothesis is supported that the random (residual) component in the regression models is determined by a common, directly unobservable factor that reflects both the influence of the cross-sectional correlation and the specific (idiosyncratic) component. With the "Panel Analysis of Non-stationarity in Idiosyncratic and Common Components" (PANIC) approach used by Bai and Ng (Bai et al., 2004), cross-sectional dependence is represented as a set of two components – common and specific (idiosyncratic). The common factor applies equally to all cross-sectional units, while the specific component is expressed in different effects for individual cross-sectional units. Latent common factors and idiosyncratic disturbances are estimated without being clear in advance whether they are stationary or non-stationary. At the next stage, the number of independent stochastic trends determining the common factors is determined. Testing for unit roots separately in the latent common and specific components is done using the individual and summary estimates, rather than using the original (observed) data or time series. The PANIC test has a number of main advantages. With it, it is possible to determine whether the non-stationarity arises from a common or a specific source, it solves the problems of unjustified rejection of the null hypothesis (size distortion), and as a general test it has much more power than simple unit root tests, and in addition has good sampling capabilities, even with a small number of cross-sectional units.

3.2. Testing for panel unit root of the indicators covered in the study
Before proceeding with the testing for non-stationarity of the studied indicators, it is necessary to determine what deterministic components need to be included in the models. For this purpose, it is good to visually examine the development of the relevant time series. Following the dynamics of the studied indicators, presented in Table 1, it would be difficult to determine any trend, since individual data fluctuate around a fixed number, symbolising the constant in the regression models. However, following the dynamics of the studied indicators, which are represented by their average values by individual years, an increasing trend can be clearly observed for each of the six indicators studied. Considering these findings, the panel unit root test is performed on the output variables applying two scenarios. In the first scenario, only a constant is entered as a deterministic component in the models, and in the second scenario, a constant and a time trend are entered. The results of the check for non-stationarity of the variables covered in the study with the tests presented above are shown in the following table:

Variable	Model	First generation of panel unit root tests						Second generation of panel unit root tests		
		LLC	*IPS*	*ADF-F*	*PP-F*	*Hadri*	*KPSS-F*	*CIPS*	*MQC*	$P_{\hat{E}}^{o}$
GDP growth	C	**-12.16**	**-5.85**	**136.23**	**113.17**	5.29	**135.16**	**-3.28**	-15.48	*2.03*
	CT	**-18.92**	**-3.75**	**146.28**	**119.56**	10.35	**128.95**	**-6.12**	-19.21	**-2.68**
HDI	C	**-3.98**	2.70	40.21	62.33	9.81	**204.37**	-2.11	-16.02	±∞
	CT	**-14.33**	*-2.12*	**104.30**	**141.31**	12.92	**136.05**	-2.07	-19.24	**-8.54**
CMUR	C	**-6.20**	-0.95	*75.08*	63.99	7.30	**161.68**	**-2.88**	-16.89	±∞
	CT	**-9.82**	-0.89	*79.83*	**94.12**	12.09	**137.02**	**-4.94**	-18.23	*2.48*
GMWpc	C	*-3.31*	-0.23	63.83	**85.85**	6.70	**150.64**	**-3.55**	-16.93	-0.93
	CT	**-12.13**	-0.83	**76.38**	**110.25**	11.12	**152.14**	**-4.44**	-19.03	0.62
RRMW	C	**-9.63**	**-3.48**	**113.96**	**107.90**	9.30	**173.78**	*-2.39*	-16.91	**4.33**
	CT	**-16.84**	**-2.92**	**123.56**	**159.63**	9.69	**144.03**	**-11.76**	-18.90	*2.24*
TRRM	C	**-6.36**	*-2.13*	*83.34*	*79.29*	6.10	**150.60**	**-2.69**	-18.46	±∞
	CT	**-10.60**	*-1.43*	**91.23**	**84.06**	12.10	**137.81**	**-9.66**	-18.69	**6.64**

Note: The designations in the table are as follows: C – the model being tested includes a constant; CT – the model being tested includes a constant and a linear trend.

MQC denotes the test proposed by Bai and Ng (2004), which tests the number of common factors, and $P_{\hat{E}}^{o}$ denotes the test for verifying the cointegration between the cross-sectional units, as in a model with a constant it is denoted as $P_{\hat{E}}^{c}$, and in a model with a constant and a linear trend – as $P_{\hat{E}}^{\tau}$.

Estimates rejecting the null hypothesis at significance level *α = 0.1* are marked *in italics*, in ***bold italics*** – the significant estimates at significance level *α = 0.05* and in **bold** – the significant estimates at significance level *α = 0.01*.

Table 1: Pooled unit root test statistics panels of indicators in the study
(Source: Authors' calculations)

Analysing the results of the time series checks using the stationarity criteria (KPSS, Hadri), we find that, without exception, for all indicators, the hypothesis of stationarity cannot be accepted. However, given the main drawback of this type of criteria, namely that in short time series, such as the present case, they tend to unreasonably reject the null hypothesis, the logical argument here is that they should not be relied upon. The situation with the other criteria from the first generation is more diverse. With each of these, regardless of whether the model includes a constant or a constant and trend when testing, stationarity is confirmed for GDP growth, RRMW and TRRM. If a constant and a trend are included in the models, the stationarity (the rejection of the unit root hypothesis) is confirmed by all the criteria, even for the HDI indicators and for the CMUR and GMWpc, and for the last two, there is an exception only for IPS, with which the null hypothesis cannot be rejected. If only a constant is taken into account in the models, for the HDI, CMUR and GMWpc indicators, their categorical determination as stationary or non-stationary is impossible. For unit root indicators of the second generation, the situation is as follows. Using CIPS (under both scenarios for deterministic components in the tested models) all indicators except HDI can be determined as stationary. With the MQC test using the PANIC approach, the validity of 6 common factors for all indicators is established, and the hypothesis of a unit root in the common factors is accepted for all indicators. This result can also be questioned because in their study Gengenbach, Palm and Urbain (Palm et al., 2004, p. 23) found that in panel data with a small number of time periods, unit root tests in the common factor proposed by Bai and Ng (2004) have little power. This means that with them, the probability of incorrectly accepting the null hypothesis is greater. Regarding the unit root in the specific (idiosyncratic) component, using the PANIC approach, it is found that the unit root hypothesis is rejected for all indicators except GMWpc. Based on the proposed unit root test procedure for panel data with dynamic factors (See Palm et al., 2004, cited by Barbieri, 2006, p. 45), when with CIPS and $P_{\hat{E}}^{\tau}$ the null pychotheses are rejected, and with MQC the hypothesis of a unit root in the common factor is accepted, cointegration between cross-sectional units can be expected. Considering the above findings for MQC, we can, with some uncertainty, assume that all series are stationary variables, which allows to apply the standard panel regression methods.

Based on the recommendation given in the Gretl Manual, the selection of a suitable panel model is determined by the number of cross-sectional units. In such a case, if the panel contains a small number of units, such as the member states of the European Union, it would be logical to use the fixed effects model, and when the panel consists of a large number of randomly selected units, the advantage is in using the random effects model (Cottrell & Lucchetti, 2022, p. 206). For the needs of the right choice, in the present case, three panel models are evaluated – pooled OLS, fixed effects model and random effects model. Based on the results obtained, a series of diagnostic checks are carried out to select the most suitable model. For the purpose, it is used F-test for the null hypothesis that the cross-sectional units all have a common intercept, the Breusch–Pagan and the Hausman test. Using the F-test, a choice is made between pooled OLS and fixed effects model; with the Breusch–Pagan criterion, a choice is made between pooled OLS and random effects model; and with the Hausman test, a choice is made between the fixed effects model and the random effects model. Analysing the obtained results, the most appropriate model in both cases (in the first case, the dependent variable is GDPgrowth, and in the second case – HDI) turns out to be the model with fixed effects, which confirms the recommendations made by Cottrell & Lucchetti, 2022. Model estimates are presented in Table 2.

Factor variables	Dependent variables	
	GDP growth	HDI
Const	**4.401**	**-0.405**
CMUR	-0.002	0.003
GMWpc	-0.002	***0.020***
RRMW	**0.018**	**0.025**
TRRM	**0.013**	**0.005**
Adj. R^2	0.289	0.951
F (27,248)	**3.31**	**65.91**
Breusch-Pagan Hausman	**15.45** **22.17**	**786.56** **17.104**

Note: F denotes the test for joint significance of differing group means, which tests the adequacy of the pooled OLS model against the fixed effects model, Breusch-Pagan denotes the LM-test for checking the adequacy of the Pooled OLS model against the random effects model, and Hausman denotes the test for checking the consistency of the random effects model versus the fixed effects model

Estimates rejecting the null hypothesis at significance level $\alpha = 0.1$ are marked in *italics*, in ***bold italics*** – the significant estimates at significance level $\alpha = 0.05$ and in **bold** – the significant estimates at significance level $\alpha = 0.01$.

Table 2: Results from Fixed effects estimator
(Source: Authors' calculations)

With F-test and LM-test of Breusch-Pagan, it is confirmed the advantage, respectively, of the fixed effects method and the random effects method over the least squares method compared to the pooled OLS method. With the Hausman criterion, on the other hand, it is found that the fixed effects model is more appropriate than the random effects model. In the model with the dependent variable GDP growth, only the coefficients before RRMW and TRRM are statistically significant at the 1% significance level, and their signs are correct from the point of view of theory, while the coefficients before CMUR and GMWpc are statistically insignificant, and with a negative sign, which contradicts economic logic. In the model with the resulting HDI magnitude, only the coefficient before CMUR is statistically insignificant. The studied four factor variables account for about 29% of the variation in GDP growth, while in terms of HDI, the variation is over 95%. This shows that the factors used have a significant influence on the Human Development Index, while in terms of the GDP growth, their influence is weaker, since more than 71% of the variation of the resulting quantity here is due to others

not covered in the study indicators (variables). The insignificance of the coefficients in front of some of the factor variables gives us reason to estimate reduced panel models without their inclusion. The results are presented in Table 3.

Factor variables	Dependent variables	
	GDP growth	HDI
Const	**4.391**	**-0.403**
CMUR	-	-
GMWpc	-	*0.020*
RRMW	**0.017**	**0.026**
TRRM	**0.013**	**0.005**
Adj. R^2	0.294	0.951
Note: Estimates rejecting the null hypothesis at significance level α = 0.1 are marked in *italics*, in ***bold italics*** – the significant estimates at significance level α = 0.05 and in **bold** – the significant estimates at significance level α = 0.01.		

Table 3: Final results from fixed effects estimator
(Source: Authors' calculations)

The elimination of the variables CMUR and GMWpc from the model with the GDP growth dependent variables leads to an increase in the share of explained variation from 28.9% to 29.4%, which determines their removal from the model as appropriate. In the HDI model, removing the CMUR do not change the proportion of explained variation in the dependent variable. According to the obtained results, all factor variables in the reduced models have a positive influence on the two dependent variables. A 1% increase in RRMW leads to an increase in GDP and HDI by 0.017% and 0.026%, respectively, and that of TRRM – by 0.013% and 0.005%, respectively. It turns out that GMWpc has a statistically significant impact only on HDI, as a 1% increase in the indicator corresponds to a 0.02% increase in the human development index. To demonstrate the differences between EU countries in the effects of circular economy indicators on socio-economic development indicators, the estimates of the constant components for individual countries can be standardised by subtracting the lowest value from each individual estimate (Kano, Ohta, 2005). The standardisation of the model for assessing the impact on GDPgrowth is carried out in relation to Bulgaria, and standartisation of the assessment of the impact on the HDI – in relation to Germany. The results show that there are significant differences among countries in the effects of the studied circular economy indicators on socio-economic development. The processes towards a transition to a circular economy in Eire, Finland, Malta and Sweden are characterised by the highest efficiency in terms of GDP, and by the lowest – in Bulgaria, Romania, Portugal and Hungary. In terms of impact on the HDI, Malta, Cyprus and Ireland have the highest impact, while countries such as Italy, the Netherlands and Belgium have the least impact.

4. STUDYING THE CAUSALITY BETWEEN SOCIO-ECONOMIC DEVELOPMENT AND THE CIRCULAR ECONOMY

We examine the causality between economic development and the human development index and circular economy indicators by the non-causality Granger test for heterogeneous panel data models, developed by Dumitrescu and Hurlin (2012). The test is based on the Wald summary statistic from the individual Granger causality tests. According to Granger, the procedure for testing the existence of a causal relationship is to test the null hypothesis of the presence of significant effects of the past values of the variable x on the present value of the variable y. The alternative hypothesis of Dumitrescu–Hurlin test suggests that there is likely a causality for some units, but not necessarily for all. The number of lags (K), which are included in the regression equation is determined based on Akaike information criterion (AIC), Schwarz

information criterion (BIC) and Hannan–Quinn information criterion (HQIC). It should be noted that when determining the maximum number of lags, it is necessary to follow the rule $T > 5 + 3 * K$. Given this, in the present study we include one lag in the construction of the regression equations, which is the maximum allowable considered the duration of the studied time series. Testing of the null hypothesis is based on W-bar, Z-bar and Z-bar tilde statistics. According to Dumitrescu and Hurlin (2012), for a large number of units and relatively short time series, such as the current panel, Z-bar tilde statistics gives the most reliable results, which was established based on a number of Monte Carlo simulations. The results of testing for the existence of a causality between the variables included in the final specifications of the two regression equations are presented in Table 4.

Causality	Z-bar tilde	Causality	Z-bar tilde
$GDPgrowth \rightarrow RRMW$	2,916 (0,004)	$HDI \rightarrow GMWpc$	2,427 (0,015)
$RRMW \nrightarrow GDPgrowth$	**1,903 (0,057)**	$GMWpc \rightarrow HDI$	6,765 (0,000)
$GDPgrowth \nrightarrow TRRM$	**0,999 (0,318)**	$HDI \rightarrow RRMW$	5,563 (0,000)
$TRRM \nrightarrow GDPgrowth$	**1,119 (0,263)**	$RRMW \rightarrow HDI$	3,767 (0,000)
		$HDI \nrightarrow TRRM$	**0,739 (0,459)**
		$TRRM \nrightarrow HDI$	**1,556 (0,119)**
Note: The values of the test characteristics at which the null hypothesis cannot be rejected at a significance level α=0.05 are marked in **bold**.			

Table 4: Summary of the Dumitrescu–Hurlin panel causality test
(Source: Authors' calculations)

With regard to the model where GDP growth is the dependent variable, the results show the existence of a one-way causality between GDP growth and RRMW, i.e. economic growth is the reason for changes in the level of recycling of municipal waste. A two-way causality exists between the human development index and two of the indicators of the circular economy, namely: generation of municipal waste per capita and recycling rate municipal waste. A lack of causation from economic growth and human development index to trade in recyclable raw materials and vice versa is established.

5. CONCLUSION
As a result of the research, the following main conclusions can be drawn. *First,* there is a positive dependence between the indicators of socio-economic development and the indicators of the circular economy, and that of the circular material use rate is not statistically significant in both regression equations. It turns out that GMWpc has an impact only on the level of the human development index, and the dependence is positive. *Second,* clear differences have been found in terms of the effects that the studied circular economy indicators have on socio-economic development in the EU countries. Bulgaria is one of the countries where the lowest efficiency is reported in terms of the impact of GDP and HDI on the processes of transition to a circular economy. *Third*, socio-economic development is a prerequisite for efficient management of municipal waste. At the same time, the amount of municipal waste generated by the population can be considered both as a cause and as a consequence of the social development of society. This result is expected given the fact that socio-economic development is associated with the strengthening of urbanization processes, which means infrastructure improvement, increased consumption and a corresponding increase in the amount of generated waste.

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INTEGRATION OF AGILITY IN THE PUBLIC SECTOR ORGANISATIONS

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ABSTRACT
The objective of the paper is to present a discussion about the agile approach possibilities in development of public policies and services and to outline the necessary changes in the introduction of agile in the public sector. A qualitative analysis is performed, and the selection criteria is related to the relevance of the agile methodology to organizational models in the public sector. More specifically, a connection of the principles of agile management with the development of public policies and public services is sought, where, it is most appropriate and necessary to apply decentralized decision-making with consideration of the opinion of a wide range of stakeholders countries. A comparative analysis is performed between the potential of agile in the public sector and the organizational environment, as a basic condition for recognizing the advantages of the methodology and its application. As a result of the qualitative analysis, guidelines for integration of agile in the public sector were derived. Due to bureaucratic constraints in the sector and a strong resistance to overturning the management philosophy entirely in the direction of the agile approach, the foundations of a hybrid management model are brought out. It takes into account the regulatory constraints of the sector, but suggests interventions to create an appropriate organizational environment for integrating agility. Some ideas for future research on the topic are derived, incl. for a possible hybrid model of implementing agile in government.
Keywords: Agile, hybrid management model, public sector organisations

1. INTRODUCTION
Agile is an innovative working approach that entered the IT industry widely in 2001 and since then has continuously expanded its areas of application. In summary, it is characterized by small, autonomous teams that communicate with customers or users of the product or service being developed. In this way, the team gains (first-hand) knowledge of the requirements directly from the users, rather than from detailed documentation. Thus, the development process starts not with detailed task planning, as in traditional approaches, but with a general description of the requested functionality, which is then discussed, broken into parts, and each part is developed in a separate cycle called a sprint. The principle of operation is a gradual iterative construction of the final product, which in the IT sector is usually expressed in continuous improvement of the required functionality through code development. The differences between agile and the traditional approach are well described in the literature, but in view of the context of this article, the basic working principle will be mentioned here. The traditional approach, also known as the waterfall model, is hierarchically organized. The traditional project objective, breaking down and addressing the activities, timelines, resources, etc. are planned in advance by the project manager or product owner and the tasks are assigned to the implementation team, i.e. the leading principle is top-down. In agile teams, the approach is bottom-up, i.e. the team independently decides how to work, in what sequence, cycles, duration (what rhythm), etc.

Agile is gradually spreading in many IT companies, which is not accidental. A study found that agile projects have four times more successes and one-third fewer failures than traditional projects (Serrador, Pedro, and Jeffrey K. Pinto, 2015). Furthermore, the concept of agility has evolved (Mergel, I., S. Ganapati, A. B. Whitford, 2020) and extends to ever larger scales at the organizational level, while at the same time entering other, "atypical" sectors. The public sector is no exception, with agile now being used not only in software production teams, but also in other non-IT activities. In other words, agile has long been more than just a modern way of designing and implementing working software. It is a holistic approach, a philosophy through which organizations can develop innovative ideas, improve management and achieve better results. With all sectors currently undergoing digital transformation to one degree or another, it's no surprise that the adoption of agile is growing steadily. For example, in the financial and insurance sectors, in healthcare, in defence, in central and local administration, a number of systems, processes, products and services need digitalisation. In the process of transformation of internal and external processes, corporate IT departments are built, and many of them at some point move to an agile organization. The reasons for this are common knowledge: an agile development cycle allows projects to be designed and executed more quickly; they are better quality because they are more responsive to changes in the environment or customer preferences. The process of transfer from a traditional to an agile working model in the public sector is not easy. The very idea of supporting innovative teams in a strictly hierarchical, bureaucratic environment is more than challenging. The objective of the paper is to present a discussion about the agile approach possibilities in development of public policies and services and to outline the necessary changes in the introduction of agile in Bulgarian public sector. On this basis, some ideas for future research on the topic are derived, incl. for a possible hybrid model of implementing agile in government.

2. METHODOLOGY
To carry out the research activity, an extended search of scientific articles was carried out in publications referenced and indexed in the world databases Scopus and Web of Science. Only publications that meet the metadata criteria in the title, abstract and keywords: agile, public in the category Public Administration, Document type Article are the included. Some of the articles were dropped because they do not correspond to the concept of agility in the broad sense of the term or only indirectly affect the work of public administration. The papers were subject to a qualitative analysis with an emphasis on the vision of the applicability of agile in public sector. A qualitative analysis was performed, and the selection criteria were related to the relevance of the agile methodology to organizational models in the public sector. More specifically, a connection of the principles of agile management with the development of public policies and public services is sought, where, it is most appropriate and necessary to apply decentralized decision-making with consideration of the opinion of a wide range of stakeholders countries. A comparative analysis was performed between the potential of agile in the public sector and the organizational environment, as a basic condition for recognizing the advantages of the methodology and its application. As a result of the qualitative analysis, guidelines for integration of agile in the public sector were derived.

3. THEORETICAL FUNDAMENTALS
Agile methodology is based on the theory of complex adaptive systems (TCAS). It originated in the natural sciences and helps to explain the behavior of nonlinear dynamic systems consisting of many interacting elements that must adapt to a changing environment (Sweetman, R., K. Conboy, 2018). The theory sees adaptation as always occurring as bottom up. In the literature, there are different approaches to using the Theory of Complex Adaptive Systems, but in general, in most cases, it includes "agents, the environment, interactions, feedback loops

and emergent system-level properties" (Sweetman, R., K. Conboy, 2018). Agents can be either individuals, teams, or even programs and projects. The choice of who the agents are depends on the research objectives and hypotheses and also on the scale of the analysis. Agents can be individual participants, members of a team, but if the analysis covers the whole industry, it can be the individual organizations. Six key properties that agents in CAS should exhibit have been identified in the literature. Agents in complex adaptive systems are capable of self-organization. They share an understanding of what the overall goal of the system is. They have some degree of autonomy.They are adaptable to the environment. They have the requisite variety for their environment. Finally, they exchange resources in pursuit of their own goals (Holland, 1992) (Sweetman, R., K. Conboy, 2018). These properties cover the principles of the agile phenomenon and allow a deeper understanding of its capabilities and also of the direction in which research should be carried out in the future.

3.1. Stages in agile development - a literature review

The literature review on the spread of agile methodology follows the natural course of development of practices that first entered the IT sector and later also other industries. Early research focused on the introduction of agility in small teams, and the challenges they face are related to team member motivation (Conboy et al, 2011), overcoming stress and resistance to changes (Tolfo et al, 2011) unsuitable organizational environment, etc. Among the most important factors for a successful transfer to an agile methodology is the need for organizational maturity not only at the team level, but also at the management level. It is indicated that the management of the company should support the changes in the processes (Boehm B. and R. Turner, 2005) – by accepting the rejection of detailed documentation and traditional control, allow the transition to decentralized decision-making, support new ways of communicating with customers, etc. It is also necessary for the management to create conditions for adequate training of the teams (Asnawi et al, 2011), for the implementation of knowledge transfer and, last but not least, for an appropriate system of evaluating achievements in an agile team. The second stage of research focuses on problems with the implementation of agile not only in individual, single projects, but in a portfolio of projects or larger systems at the organizational level, i.e. scaling agile. Assessments of agile's effectiveness here are somewhat conflicting. On the one hand, there is an improvement in results - for example, higher customer satisfaction, optimization of costs and time. At the same time, however, integrating agile practices into traditional systems causes disturbance and resistance in organizations (Nuottila et al, 2016). Agile teams usually have to interact with unagile ones. (Lindvall et al, 2004). For example, the HR Department operates following traditional personnel management models, but at the same time has to serve agile teams, incl. to provide conditions for personalized training when necessary. This creates tension in the system and requires additional coordination and integration efforts. Lindvall and co-authors report controversies and tensions in quality assessment (Lindvall et al, 2004). In large companies, it is traditionally carried out centrally through various standards and evaluation systems. This is contrary to the agile methodology, where product or service quality is assessed at the end of each iteration, in small steps in the development process. Most often, this contradiction leads to the application of dual control - both centralized and decentralized, which makes the results more expensive and can demotivate the participants (Lindvall et al, 2004). A qualitative breakthrough in the development of agile is its application in a broader sense of the concept, when it is applied to non-typical (non-IT) products and services. This spread is a true testament to the validation of a well-functioning methodology that finds wide application beyond the original intentions of its creators. The most profound arguments for this can be seen in the development of public policies and in the provision of public services. The public sector manages the most important systems for the functioning of society, for the development of which adequate public policies should be

developed and implemented. Until now, the traditional approach to policy development is defined as a linear process, i.e. it covers a series of sequential steps. It is carried out by the "top-down" method, i.e. it is hierarchical, with major decisions being made at the top, and tasks being performed from the lower levels. Decisions are preceded by analyzes of professionally engaged experts. However, it is well known that policies do not always achieve their goals, even in the best performing and transparent administrations. Irrational decisions are made (Howlett, 2014), non-working reforms are initiated, for which unjustified budgets are spent. New Public Management (NPM) tries to modify the process by introducing some new elements. It relies on decision-making methods adapted from business to the public sector. The involvement of a larger number of interested parties is encouraged, by developing various tools for their participation and to achieve representativeness. However, the NPM fails to sufficiently improve the quality of the developed policies. Agile brings a new perspective to the policy development process. Instead of being linear, this process now becomes cyclical, where improvements are achieved through successive iterations. Validation also happens in small steps, with users providing feedback. In addition to public policies, agile is also applied to the development of public services. Traditional method of developing public services is usually implemented through a centralized service design that follows the well-known linear model. In this approach, through the means of analysis, organizations try to understand what problems society is facing and then seek to create or design some kind of service to meet the identified needs. Most often, this is done without detailed testing (for example, by polling the recipients of the service), which is why it may not lead to the desired effect (Peristeras, V., Tarabanis, K., 2008). At the same time, when inconsistencies exist, they manifest themselves from the bottom up, i.e. it is the users who identify the imperfections of the offered service. In the context of agile, the traditional approach seems hopelessly outdated (McBride et al, 2019). An agile approach to developing public services requires reversing the process. In general, this means interviewing the owners of the process on the one hand, and the service users of that process on the other hand. (Mergel, I., S. Ganapati, A. B. Whitford, 2020). In this way, the type and nature of inconsistencies (bugs) can be seen much more clearly and user-centric (rather than administration-centric) service delivery can be implemented. The approach also allows good practices to be identified and documented so that they can be continued in the future. Equally important in this process is the involvement of low-level employees in the design of public services. This improves their responsibility for quality and their commitment to the organization through participation.

3.2. Integrating agile in the public sector

Creating an agile team in a public sector organization can be seen as creating a startup (Lindquist, E., M. Buttazzoni, 2021). In this connection, the question of what results are expected from such a niche (agile team) becomes particularly interesting. The result may be a prototype of a public service, a proposal for a new policy or for a new internal process, but they will not be in a finished form, i.e. they will need to be further developed and validated, and with the help of other parts of the organization that are not agile and are accordingly dominated by hierarchical values and practices. Collaboration with these parts is an issue on which future research efforts can focus. Well-functioning techniques for initiating flexible projects in public administration include: development of a pilot project for building an agile team; gradual adoption of agile techniques as alternatives to traditional development; observing other institutions that use agile practices; and reconfiguration of internal processes to give the team autonomy (Rosa, M. da, E. Pereira, 2021). Implementing agile in the public sector as a model of adhocracy (as opposed to bureaucracy) in well-ordered, if not always efficient, public structures is a difficult process. Sometimes it's like „pulling against gravity" (Bakvis, H., and L. Juillet, 2004).

That is why agile teams in the public sector must find a way to co-exist with others, to integrate with them (Lindquist, E., M. Buttazzoni, 2021). Agility is a mindset that initiates cultural change in bureaucratic command and control organizations (Mergel, I., S. Ganapati, A. B. Whitford, 2020). While in traditional organizations the results are reports, in agile ones the results are satisfied users whose problems are solved. It is also clear why the problem occurred and how it was solved. This process is transparent, not because it is included in a report, but because it was decided by stakeholders (Mergel, I., S. Ganapati, A. B. Whitford, 2020). Agile develops a culture within the organization that values individual contribution. In this way, employees become more responsible, engaged and empowered. A fundamental condition for agility is overcoming the culture of penalty for mistakes made. On the contrary, it is believed that administrations that make mistakes in the process of the first iterations learn faster and are better equipped to make improvements. That is why public managers should abandon the culture of zero failure so that employees are free to make mistakes (Mergel, I., S. Ganapati, A. B. Whitford, 2020). As part of the agile culture is also the way of decision-making, which should be consensual. This means a new leadership style and even empowering the non-leaders (Mergel, I., S. Ganapati, A. B. Whitford, 2020). The result is stronger job performance, job satisfaction, and commitment to the organization (Lee, Allan, Sara Willis, and Amy Wei Tian, 2018).

4. STRATEGIC GUIDELINES FOR INTEGRATION OF AGILE IN THE PUBLIC SECTOR IN BULGARIA

The public sector in Bulgaria operates in a strictly determined environment in terms of information flow and reporting levels, and is normatively regulated regarding the functions performed. Every single work process is characterized by a beginning and an end, i.e. the outcome of the process is clear. In a large part of the administrations there are functional characteristics at the level of unit, department, directorate, and in all administrations and for each position there are job characteristics describing the commitments. In practice, this means that it is clear who does what in terms of the execution of each individual sub-process, be it related to the performance of an administrative service, or be it related to an internal organizational activity. In addition, the presence of a large number of internal rules, instructions, guidelines, etc. further specify and parameterize the processes and their course. In general, in the public sector in Bulgaria, work is standardized, i.e. processes are far from the understandings of agility developed above. Of course, without completely denying the need for regulation, it is important to note that the continuous pursuit of standardization leads to the depersonalization of employees, in terms of innovation, creativity and autonomy at work. This reduces the effectiveness and efficiency of the sector and declines the motivation of the public to support and work in partnership with the authorities. These core features are largely at odds with agile principles. The need to implement agile is associated with dynamically changing environmental conditions that place new demands on public services provided, processes implemented and public policies implemented. Increasingly, processes are seen as multi-level, multi-participant intensified feedback systems (Lehman, 2001). It is the rapid and directly addressed feedback and the dynamics of iterations that are at the heart of the application of the methodology. The bottom-up approach in the public sector was sporadically applied even before the introduction of agile as a management methodology. It is usually related to civic participation and initiatives, such as public councils, forums, youth centers, etc. formal and informal structures. In Bulgaria, their activity is not high. Most often they perform monitoring functions or are partially involved in policy development. Nevertheless, there are enough practices of successful initiatives at the local level, which have been carried out with wide participation and the local authority has created suitable conditions for their implementation.

This can be taken as indirect evidence that in the public sector in Bulgaria there is space for implementing agile practices. This potential should be developed at the organizational level, for which some efforts are needed. Effective agile practice is based on a framework of guiding principles (Augustine, 2005), that should be the subject of focused efforts at the organizational level. On this basis, the following measures for the transition from traditional to agile management can be formulated (Table 1):

| Principle | Specifics of workflow execution | | Transition from Traditional to Agile management |
	Waterfall	Agile management	
Teamwork	A team is missing. There are individual officials who, within the scope of their duties, perform a set of work operations, following an express order - written or verbal. Strict adherence to job responsibilities. Individual performance without interaction.	Limited minimum team or working group size. Self-organization is leading, close interaction and cooperation within the team and with employees external to the team, without observing narrowly scheduled job commitments, but with specified clear roles and responsibilities.	Efforts to promote teamwork in the organization by enforcing an organizational culture that encourages an agile approach to work. Level of change: organizational Level of intervention: individually Measures: training of management positions in the organization; mentoring in the initial implementation of tasks in a team.
Communication	Strict adherence to hierarchical communication and reporting channels. Cumbersome procedures for providing information between employees and units.	Optimal internal communication channels, without following a strict reporting hierarchy. Maximum transparency and accessibility of information.	Building a communication culture to optimize the communication flow. Level of change: organizational Level of intervention: structural unit Measures: introduction of control points to minimize the risk of unregulated leakage and loss of information.
Engagement	Each member of the team or work group is solely committed to the outcome of their operational task, without subsequent commitment and interest in the final outcome. Participating work ends at the operation level. Lack of autonomy and creativity at work. Strict compliance with internal regulations and practices.	Each member of the team or work group is committed both to the outcome of their particular engagement and to the final outcome of the entire process. Entrainment is a permanent process and involvement does not end until the overall task is accomplished. This approach ensures the autonomy and creativity of team members.	Encouraging commitment to the organization and clarifying everyone's individual contribution to achieving its goals. Level of change: organizational Level of intervention: individually Measures: investments in personnel and talent development, incentives, clear rules for career development.
Simple work rules	Vague and complicated rules, numerous internal regulatory documents, often with contradictory instructions. Not knowing the requirements in full due to high volume and difficult accessibility. Review on request of the regulatory framework or control authorities and correct, supplement and expand the rules, leading to complexity and bureaucracy.	Clear and simple rules of work that are known to everyone in the team. A minimum set of rules, instructions, guidelines. Easy to work with the rules and quick orientation when making decisions. Ongoing review and adjustment of rules for work-driven simplification and improvement.	Reduction of bureaucracy and reduction of the internal regulatory framework. Providing intuitive digital tools to find information about process requirements. Level of change: organizational Level of intervention: structural unit Measures: clarifying and simplifying the regulatory framework at the organizational level and ensuring quick and easy access to it.
Access to information	Exchange of information upon express instruction, provided in a pre-approved order. There is no system for sharing knowledge, it is transferred by chance or on the initiative of potential talent in the organization.	Intensive exchange of information that is open access. The participants in the work process benefit from the power of knowledge, regardless of its source.	Improving the information culture of employees and encouraging knowledge sharing. Level of change: organizational Level of intervention: organizationally Measures: introduction of a digital knowledge management system and provision of open, non-hierarchical access to information related to a performed task.
Management style	Total control, significant intervention, long line of hierarchical reporting and decision making for action.	Light-touch management style, no cumbersome control procedures, minimal intervention, clear tasks, quick and informal feedback.	Liberal management style, stimulating rapid adaptation to changing environmental conditions. Level of change: organizational Level of intervention: structural unit Measures: minimization of institutionalized control mechanisms and stimulation of self-control and decision-making autonomy within the given powers.
Leadership	Institutional leadership based on normative regulation and established hierarchical relationships. The processes are understood from the point of view of the existing practice and normative regulation. This management approach is based on the system order in the organization, which is typical of systems with large structures that are rigid and bureaucratic.	Adaptive leadership - based on "systems thinking" to understand the internal forces of the process. For example, events are understood in terms of their patterns or common elements that recur under different circumstances. This leadership approach balances on the edge of chaos (according to the concept of complexity theory).	Formal leadership based on informal leadership criteria. Observance of the normatively regulated order while respecting organizational freedom. Level of change: organizational Level of intervention: individually Measures: implementing an appropriate tone at the top and supporting activities to transform formal leaders into informal ones through direct involvement and commitment to teamwork, stimulating interaction and team building.

Table 1: Integration of agility in the public sector organisations
(Source: the authors)

Traditional management may have exhausted its potential in terms of value creation for public sector organizations. In the conditions of a dynamically changing environment, the implementation of new principles for working in private sector and the development of ICT, it is appropriate to look for modern solutions for the public structures. It is indisputable that a complete integration of agile principles and practices is not possible due to the specifics of government functioning. For this reason, it is necessary to make a thorough analysis at the organizational level of what is possible to be implemented and in what way it is appropriate for this to happen. It is hardly possible to completely change and overturn the management philosophy entirely in the direction of the agile approach, but it is quite realistic to lay the foundations of a hybrid management model that takes into account the regulatory constraints of the sector.

5. CONCLUSION
The public sector still lags behind compared to business in terms of applied management approaches and models. To a large extent, this is determined by the highly regulated environment in which it operates, as well as by the complexity of organizations as systems for ensuring public policies and providing public services of common interest. The agile approach works in a number of sectors and has demonstrated good results. Administrations are not closed structures that do not interact with the environment. On the contrary, precisely because of their great importance for the community, it is necessary to create a culture of transfer of management practices that can improve the quality of the sector's functioning. In practice, most administrations combine in some hybrid form hierarchical and liberal models of governance. Examining their success requires research efforts related to both governance models and the measurement of factors and effects of their implementation. The strong bureaucratization of work processes for the most part stems from accumulated experience and consolidated practices, recorded in a number of internal documents for the organization - rules, instructions, procedures. It is a fact, however, that the national legal framework is sufficiently liberal and leaves freedom of choice of management model. Evidence for this statement, for example, is the different economic development of a number of municipalities with similar characteristics, which comes to show that the approaches to providing public services to citizens and businesses and to conducting public policies largely depend on the management team and the so-called "tone at the top".

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ECONOMIC CRISIS: INFLATION IN POST-COVID TIME

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ABSTRACT

This paper explains why the world's economies suffered higher inflation rates after the coronavirus pandemic. It was expected that deflation and recession would hit the economy; however, supply-side effects and government monetary and fiscal policy responses managed to maintain a relatively solid aggregate demand, ultimately causing high inflation. As a result, it was found that the US economy has grown around 5.7 percent in 2021, making it the highest inflation rate since 1984. Furthermore, the paper highlights another significant reason for such high inflation is the low-interest rates given by the US and UK central banks. While those impacts were significant, the research shows that the global supply chain crisis caused a significant decline and even halted electronics production, leading to increased prices due to the scarcity of the products. Moreover, the paper shows that the Russia-Ukraine war had a significant role in the world's inflation, especially in Europe. It was seen that since Europe imports much of its oil and natural gas from Russia, energy prices rose exponentially as the conflict continued. In addition, more European countries have sanctioned Russia since its invasion by banning exports or raising import tariffs, reducing supply and worsening inflation. The war has also devastated Ukrainian agriculture, driving up food prices. Lastly, the paper states that while there is contradicting opinion on what the inflation rate will be in 2023, most forecasts predict that the inflation rate would decrease to a level of around 2.6 percent in 2024 or in the long term.
Keywords: COVID-19, economic crisis, global economy, inflation, pandemic

1. INTRODUCTION

COVID 19 has severely impacted most of the world's economies over the past few years. Many economists predicted that COVID-related disruptions to demand would cause deflation. Most importantly, as authorities mandated more quarantines and lockdowns, consumption spending, the largest part of aggregate demand, was expected to decrease significantly. Secondly, economists expected that governments would implement trade restrictions, reducing overall trade levels. The broad reduction in aggregate demand would tend to cause recession and deflation, absent any supply-side effects. However, it turned out that supply-side effects have been important, and government monetary and fiscal policy responses managed to keep aggregate demand relatively robust. This has caused high inflation in many of the world's leading economies, as seen in the graph below.

Figure following on the next page

Change in consumer prices from a year earlier

— Euro area — United States — United Kingdom

Note: Euro area and U.K. data are Harmonised Index of Consumer Prices. U.S. data is the Consumer Price Index excluding owners' equivalent rent. · Sources: U.S. Bureau of Labor Statistics, O.E.C.D., Eurostat · By The New York Times
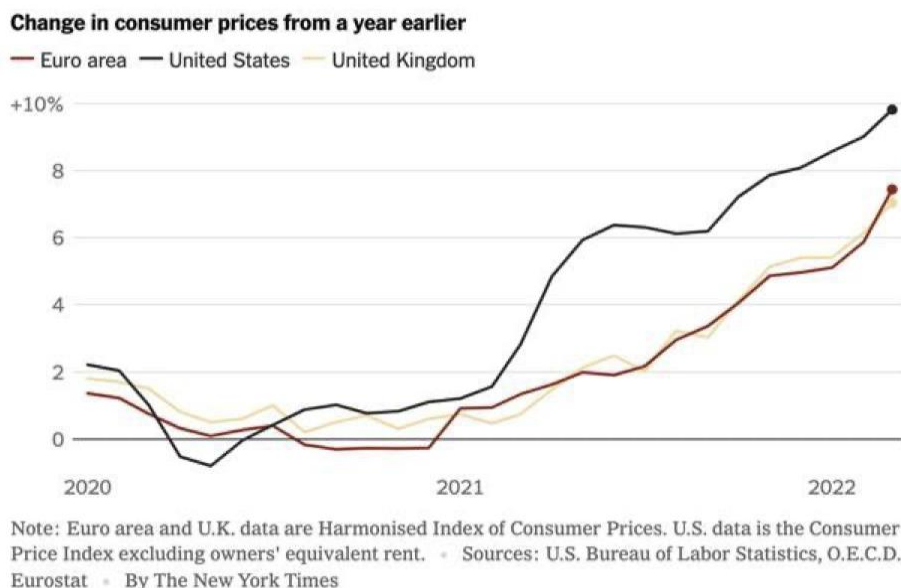
Figure 1: Change in consumer prices from a year earlier

2. EXPANSIONARY FISCAL POLICY

Rather than deflation, inflation has surged in most developed countries in 2021 and 2022, especially in the USA and Europe. One cause has been expansionary fiscal policy, shifting the aggregate demand curve to the right. "The [US] economy grew 5.7% in 2021, the strongest since 1984, as the government provided nearly $6 trillion in pandemic relief" (Mutikani, 2022). The economy grew in the short run because of this fiscal stimulus, but one consequence has been inflationary pressures resulting from expansionary policy. This includes increases in government spending, but perhaps more importantly decreases in net taxes from sending consumers stimulus checks and extended unemployment benefits. These provided higher disposable incomes and increased the consumption portion of aggregate demand. Besides the USA, the EU also pursued expansionary fiscal policies. In general, they were pretty similar to those of the USA, but the overall amount of financial subsidies and recovery funds proved much smaller. For all of the member states added together, the total amount financial support was around 2300 billion pounds, which also included subsidy packages for all businesses and workers amounting to 540 billion pounds. As these stimuli were spread across all the EU, each individual country received much less from subsidies and federal emergency financial support than the USA did, which explains why the EU had relatively moderate inflation rates. In addition, since the EU expanded its budget too, this would spur a higher inflation rate, as well as more debts across the Euro zone.

3. EXPANSION MONETARY POLICY

Monetary policy, particularly in the USA and the UK, has also been strongly expansionary. (The Euro zone did not reduce interest rates much because they were already in negative territory and could not feasibly lower rates further). As shown in the graph below, both the US and UK central banks reduced interest rates to near zero within the first couple months of the pandemic, which had the effect of stimulating both investment and consumption, shifting aggregate demand to the right. As we can see from the federal funds rate graph below, both the US and UK dropped their federal funds rates significantly just about one month after the COVID-19 hit most countries and quarantines took effect. Governments were trying to encourage consumer spending in order to boost real GDP.
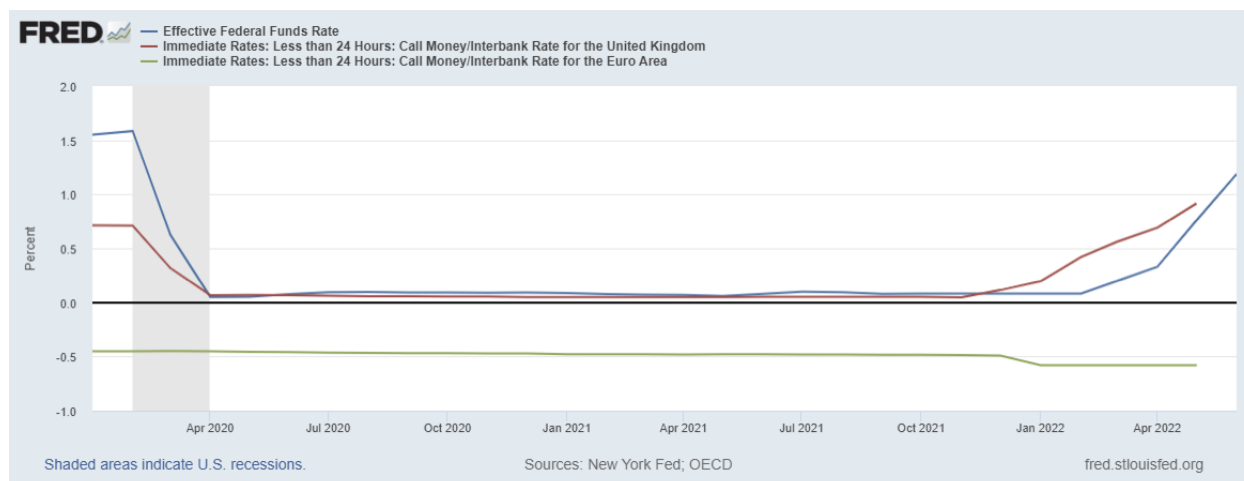
Figure 2: Federal funds rate graph below
(St.Louis FED, FRED)

4. SUPPLY CHAIN ISSUES

On the supply side, there has been a negative shock for several reasons. First, there have been ongoing supply chain issues, because of different COVID-related policies, such as reducing international travel in order to lower the risk of international COVID transmission, shutting down of factories and industries when there were lots of confirmed cases, mandatory quarantines, and so on. These all proved detrimental to global trade and the interdependent supply chains for all countries. Many major ports around the world also shut down to help prevent the spread of the virus through shipping cargoes.

4.1. Semiconductor

Another aspect of this global supply chain issue is that there is a major component for most electronics during the pandemic, and that is the semiconductor. The global supply chain crisis, during the pandemic, would especially disrupt a major component in electronics: the semiconductor. Semiconductors, including microchips, are mostly manufactured in China. Since COVID-19 broke out first in China, it was also the first country to start shutting down factories in order to curtail further spread of COVID. As more and more semiconductor factories and major ports in China shut down, it caused a decline or even halt in production of other products. Semiconductors are vital for any electronic product, and scarcity of semiconductors can cause production halts in several sectors. These include automobiles, airplanes, toys, computers, etc. (*Supply Chain bottlenecks and inflations: The role of semiconductors*). The fact that there are very few substitutes for semiconductors is another important contributing factor to the generalized supply shock. This feature of semiconductors indicates that it is a relatively inelastic good – its scarcity increasing its price.

4.2. Russian-Ukrainian War

Further inflationary pressure from the supply side, particularly in Europe, has come from the Russian-Ukrainian War, beginning in February 2022. As the conflict continues, energy prices have risen exponentially, because Europe imports much of its oil and natural gas from Russia. In the months since Russia's invasion, more European countries have sanctioned Russia by banning its exports or raising import tariffs which reduces supply and worsens the inflation situation. Furthermore, the war has devastated Ukrainian agricultural production, causing steep increases in food prices.
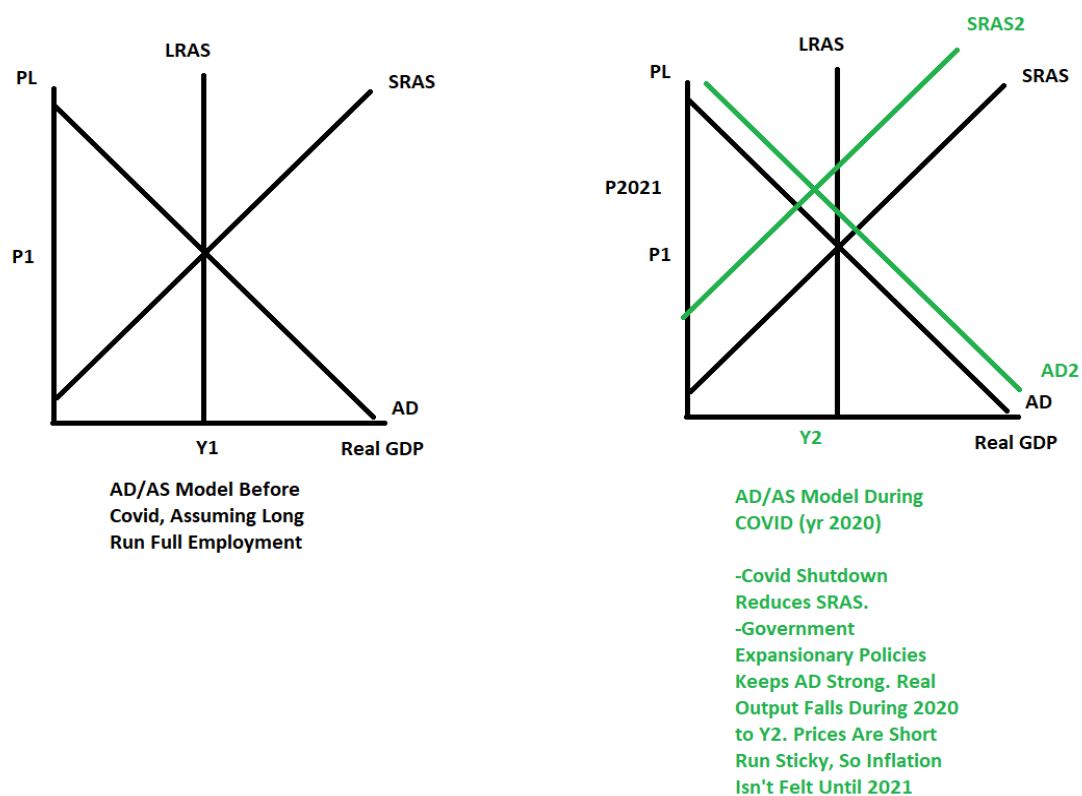
Figure 3: Overall shifts to both aggregate demand and aggregate supply that have occurred since the beginning of the pandemic

The graph above shows the overall shifts to both aggregate demand and aggregate supply that have occurred since the beginning of the pandemic. It shows that a large rightward shift in aggregate demand has caused the increase in real GDP, offset only somewhat by a leftward shift in aggregate supply. However, both of these shifts are inflationary, and recent interest rate hikes in the US and UK have yet to effectively lower inflation rates.
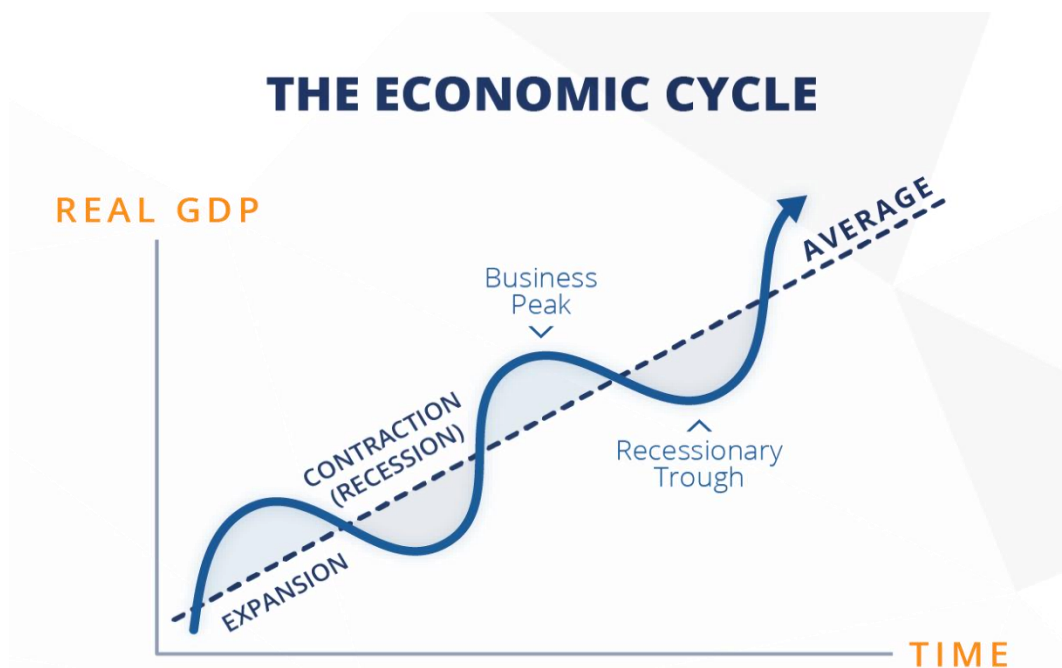
Figure 4: The economic cycle

5. CONCLUSION

As most economists believe currently, they have predicted coming recessions for global economies. The FOMC (Federal Open Market Committee) predicts that the inflation rate will remain high till the end of 2022, with an average of 4.3%, and then decline to 2.7% in 2023 (US Inflation Forecast: 2022, 2023 and Long Term to 2030 | Data and Charts - knoema.com, 2022). However, some organizations and economists argue that inflation rates will remain high or even increase in 2023. What these forecasts have in common is that the inflation rate would decrease to a level of around 2.6%, in 2024, or in the long term. This makes sense because it fits well in the economic cycle. What this graph essentially shows is a cycle going from an inflationary period to a stable economic period, then to recession, and eventually back to inflation. To conclude, the inflation rate basically depends on the balance of aggregate demand and aggregate supply. Also, it depends on the supply of workers, which is closely related to the aggregate supply, which in turn influences production levels. When the unemployment rate is low, with a higher number of workers in the labor market, average income would also rise. When the average income level rises, then company owners tend to raise the market price levels in order to afford the expenditures on high numbers of workers. This would cause the workers to demand even higher wages, eventually sustaining a negative loop, causing severe inflation.

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SMALL OR BIG IS FISCAL MULTIPLIER?

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ABSTRACT

During the COVID 19 pandemic all governments in the world use fiscal packages to decide the health and economic crises. It requires the evaluation of effectiveness of public spending made. The appropriate measure is the fiscal multiplier. The fiscal multiplier measures the short-term impact of discretionary fiscal policy on Gross domestic product (GDP). The discretionary fiscal policy realizes through the usage of fiscal instruments as public spending and taxes. The fiscal multiplier could be calculated as the ratio of changes of GDP (ΔY) to a discretionary change of public spending or tax revenue (ΔG or ΔT). This research uses first type of the multiplier measuring changes of GDP by such o public spending with one. This research measures fiscal multiplier for Bulgaria for the period 2008-2021. By the calculated "Impact multiplier" where it tested changes of GDP and public spending only in the current period, the volatility of multiplier is very wide. During the financial crises and following recession between 2008 -2010 the value of fiscal multiplier is negative. Before the COVID 19 crises it fluctuates in small pace, mainly with positive value and higher is in third quarter of 2017. For the period 2008-2021 is 0.21. Despite the low value, it is statically significant and public spending influence on the Gross Domestic product (GDP). This instrument of fiscal policy could use for the stimulation of economic growth.
Keywords: Fiscal policy, public spending, fiscal multiplier

1. INTRODUCTION

During the COVID 19 pandemic all governments in the world use fiscal packages to decide the health and economic crises. The public spending does not use only by this crises, but regular to stimulate the economic activity during the different stage of economic cycle. It requires the evaluation of effectiveness of public spending made. The appropriate measure is the fiscal multiplier. As it known, the economic growth would stimulate through monetary and fiscal instruments. The main market oriented fiscal are public spending and tax (excluding administrative measures). It requires they are using effectively. The fiscal multiplier is also important for the design of fiscal policy and forecasting. The definition of fiscal multiplier is a change in GDP or other measurement of aggregate output by induced one unit change of one of fiscal variables – public spending or tax. This research uses first type of the multiplier measuring changes of GDP by such of public spending with one. The International Monetary Fund introduces the Special Data Dissemination Standard (SDDS) in 1996. Subscribers to this standard are required to collect and report central government expenditure data at annual base. This research calculates the fiscal multiplier in short run for Bulgaria on quarterly base.

2. LITERATURE REVIEW

Many studies made contemporary research of fiscal multiplier in high-income and developing countries. They find differences between these two types' impacts - for high-income countries is 0.37. In other words, one additional currency (for example Euro) of public spending will add only 37 cents to output in the quarter in which it is incurred. This effect of public spending is small, but statistically significant. For developing countries, the impact multiplier is negative - minus 0.21 and is also statistically significant. Based on a survey of 41 studies, Mineshima and others (2014) find first-year multipliers on average to 0.75 for government spending. The spending usually impact automatically so-called "automatic stabilizers".

During the crises usually government increases the spending to replace lost private consumption. When during such period it made countercyclical policy with decrease of public spending, the GDP also change in some direction with more high pace (example is Bulgaria during the period 2009-2010 by previous economic crises). Romer and Romer (2010) and the IMF (2010) use information from budget to directly identify exogenous fiscal policy changes. Cloyne(2011) investigates also such changes for United Kingdom. Blanchard and Perotti (2002) research the impact government investment and consumption on aggregate supply. The different approach to calculation of financial multiplier is shown below:

Study	FM	Notes
Barro and Redlick (2011)	0.4–0.6	**Based on U.S. defense spending news; 1917–2006; Lower multiplier for temporary spending changes, higher end of range for permanent spending changes.**
Guajardo and others (2014)	0.3	**Overall spending shock. After two years, multiplier reaches about 1.**
Hall (2009)	0.6	**Based on U.S. defense spending news; 1930–2008.**
Owyang, Ramey, Zubairy (2013)	United States: 0.8. Canada: 0.4–1.6	**Based on U.S. defense spending news; 1890–2010 for the United States, 1921–2011 for Canada. Two year multipliers; in Canada range of multipliers reflects low unemployment (low multiplier) and high unemployment (high multiplier) regimes. In the United States, multipliers do not differ significantly across regimes.**
Ramey (2011)	**1.1–1.2**	**Based on U.S. defense spending news; 1939–2008 "defense-news" reflect changes in the expected present value of government spending in response to military events; peak multiplier after 6 quarters.**

Table 1: First-Year Spending Multipliers
(Source: Batini Nicoletta, Luc Eyraud, and Anke Weber, A Simple Method to Compute Fiscal Multipliers, IMF, Working paper 1493, 2014)

3. PROBLEM STATEMENT

There are two types of factors influence on financial multiplier:(1) structure characteristics influence on the answer of economy to fiscal shocks by the expansion and (2)temporary cycling factors due to change in made fiscal policy vary the level of fiscal multiplier. The key structural characteristics include:

- Trade openness of the economy. Bulgaria is small and open economy;
- Flexibility of labour market – such economies have usually smaller financial multiplier, because salaries vary, it make stronger effect of financial shocks on flexible wages and typically reduce the response of output to demand shocks (Gorodnichenko and others, 2012).Bulgaria is economy with small non flexibility labour market and it defines higher financial multiplier;
- Exchange rate regime – the country with flexibility currency rate have higher multiplier due to changes of currency rate offsetting the effects of discretionary fiscal policy. (Born and others, 2013; Ilzetzki and others, 2013). The Bulgarian national bank(BNB) works according the rules of Currency board with fixed currency rate to reserve currency and this factor wouldn't influence on multiplier);

- By the high level of debt, the fiscal multiplier will be lower, because the lost of confidence and effect on the interest rate premium(Ilzetzki and others, 2013, Kirchner and others, 2010). Bulgaria is country with low level of sovereign debt and this factor will be positive factor;
- Public spending – by the inefficiency of these spending limits the effect of fiscal policy on GDP. Due to it, the research investigates the impact of public spending.
- The second group of factor includes:
- Stage of business cycle;
- Monetary policy- expansionary monetary policy can limit the impact of contraction fiscal shocks on demand. This research does not investigate the temporary factors.

4. METHODOLOGY AND DATA
4.1. Methodology
The research is implemented vector autoregressive (VAR) approache. This study employs the Blanchard and Perotti (2002) structural identification procedure, which accounts for the effect of automatic stabilization on public spending. Blanchard and Perotti (2002) model estimate following equations:

$$Y_{n,t} = \sum_{k=1}^{n} SP_{n,t} + u_{n,t} \qquad (1)$$

Where
Y – Gross Domestic Product for current quarter
SP – Public spending by consolidate fiscal program for current quarter

An increasing public spending has a direct effect on the economy, because higher demand for goods and services. As a result, income and employment increase not only in the sectors where public spending is taking place. Its movement stimulates consumer spending, due to higher purchasing power of household. The empirical data indicates increased public spending has stronger effect on the stage of the economy. The public spending may take the form of consumption or investment expenditure.The consumption influences only in current quarter. In differences the investment expenditure has not only effect in current quarter, but they are multiplication impact. But multiplication effect is different through the period of recession or of expansion. The public spending influence on GDP and the fiscal multiplier shows this relation. In opposite side, the higher revenue of government budget enables government spends more and increases the public spending.

4.2. The variables used in the model
- GDP – quarterly, the data used for its measurement on the components of Final Consumption Expenditure. This indicator of GDP fully correspondents to public spending as a component of aggregate demand, including consumption, investments, public spending and net export. The research use nominal measure of GDP, because low index of inflation in Bulgaria during observed period;
- Public spending financed with national funds – quarterly, nominally by the consolidated fiscal program.

4.3 Limitation of research
- Due to the different calculation of variables by the statistics – with or not accumulation, monthly or quarterly – are recalculated the different variables to be mathematically compatible - quarterly, without accumulation and in BGN;

- The survey uses the data of consolidated fiscal program for the period;
- It is very difficult to distinguish the impact of factors' variables on the changes of GDP or such are the result from automatic adjustment and due to it, the research suggests as a reason for changes only the influence of independent variables.

4.4. Data analyze

The public spending in Bulgaria characterizes with the volatility as in the different quarters in the year, also by comparison of years. The biggest positive changes are in the last quarter every year. It is typical for the Bulgarian economy to make the biggest expenditures in the fourth quarter. By comparing the years, the largest deviations are in 2018 and 2020. For the last year could be explained with government measures taken to offset household and business incomes from the COVID19 pandemic
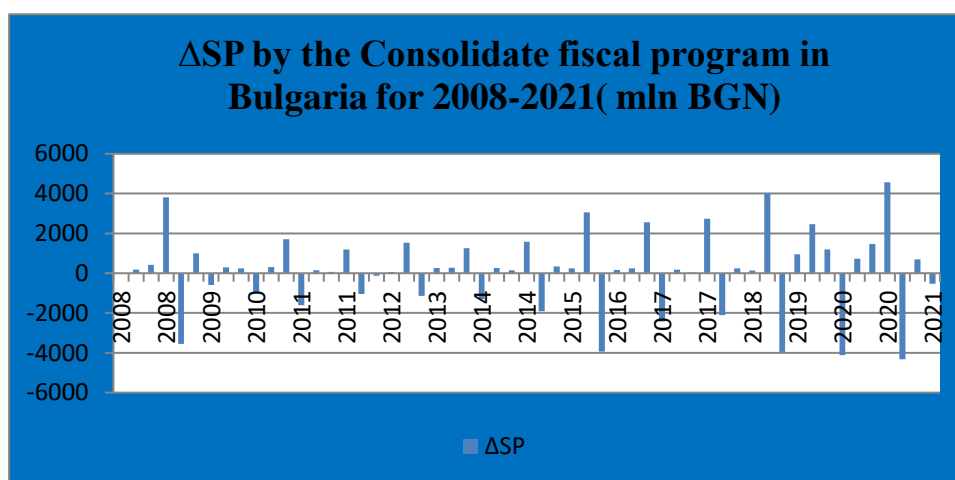
Graph 1: Change of public spending by Consolidate fiscal program in Bulgaria for 2008-2021
(Source: Ministry of Finance, Bulgaria and own calculation)

The higher negative changes in GDP are in the first quarter of more of years in the period. The highest value of volatility is in 2019 and 2021. The positive changes are observed in third quarter every year. In Bulgaria the tourism is priority sector and adds to GDP mainly in third quarter. By the comparison year with year, for the whole period, excluding 2020 due to COVID19, Bulgarian economy realizes the economic growth.
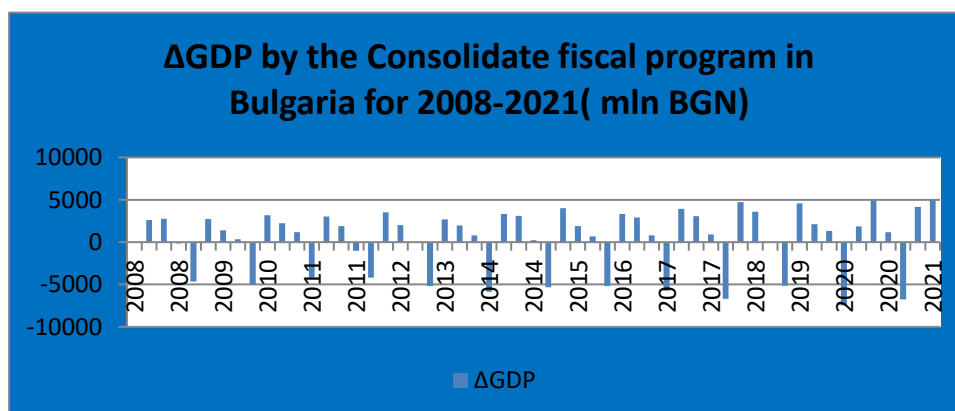
Graph 2: Change of Gross Domestic Product by Consolidate fiscal program in Bulgaria for 2008-2021
(Source: Ministry of Finance, Bulgaria and own calculation)

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The effectiveness of one BGN public spending is higher in 2011, 2012 and 2017 during the observed period. The smaller is in 2020 and 2021 due to COVID 19. By the calculation of elasticity of GDP for one BGN , it is higher in third quarter every year.
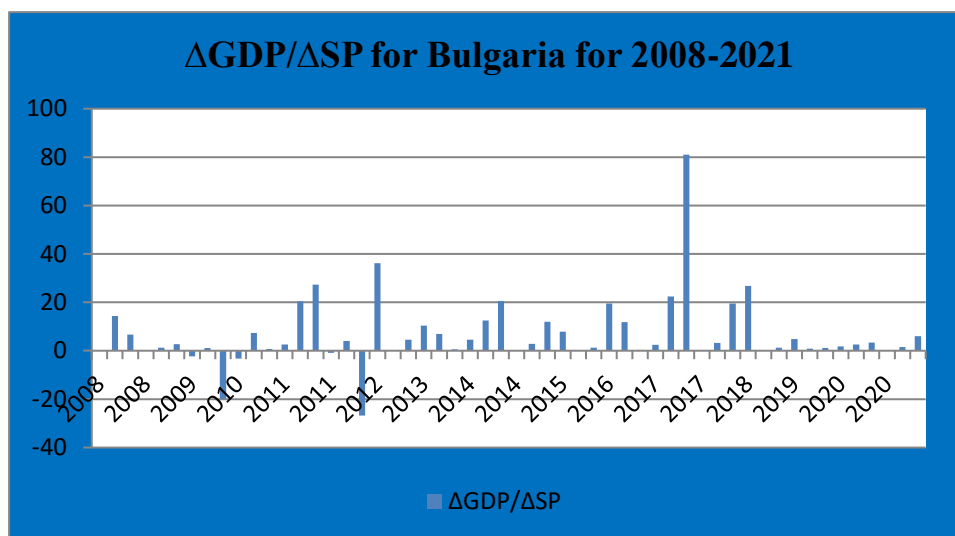
Graph 3: Change of Public Spending and Gross Domestic Product by Consolidate fiscal program in Bulgaria for 2008-2021
(Source: Ministry of Finance, Bulgaria and own calculation)

5. RESULTS

By the research is tested vector autoregressive model VAR(4) for Bulgaria for period 2008-2021.The fiscal multiplier for this period is **0.21**. It is with small value, but is statically significant. Compare with such multiplier calculated for the first decade after the transition, it has increased. There are the differences between the impact of public spending on GDP in first and last quarters of every year and second and third. The most effective are the public spending in last quarter. Usual for Bulgaria is the higher public spending to make in last part of year, sometimes – non targeting transfers go to beneficiaries. The factors increasing of the fiscal multiplier in Bulgaria are following:

- The economic horizon is short. The public spending (for salaries) in same quarter influence on consumption. It will raise aggregate demand and in the end will growth aggregate supply – GDP;
- The low level of government and public debt;
- Monetary policy is not active. Bulgarian National Bank (BNB) works by the rules of the Currency Board. Due to it, BNB keeps only one instrument – required reserves. It does not permit the bank to realize active monetary policy;
- Less developed financial markets and main financing for households and business come from the Commercial banks. It limits the consumption and investment in private sector and keep the level of aggregate demand and GDP.

The factors decreasing of the fiscal multiplier in Bulgaria are following:

- The economy is small and open. The disruption in supply chain or shrinking of export strongly influence on aggregate demand and supply;
- Collection of tax revenue. It defines disposal resources;
- Inefficiency of public spending management;
- The saving with precautionary motive will be more in uncertain environment.

All these factors add or reduce the fiscal multiplier in Bulgaria and lead to smaller fiscal multiplier compared with such in developed countries.

The analysis identifies several problems for the decision in the next years:
- The authorities should remove barriers for the absorption of EU funds and public spending with them. It will allow more efficient use of EU funds by the building of infrastructure;
- The high share of the informal economy limits the tax revenue and creates resources for higher productive infrastructure spending. Financing with government debt it would lead to undesirable crowding-out effects in other parts of the economy;
- The subsidies and other non-targeted government transfers could be decreased to make room for more growth-enhancing spending. In Bulgaria, subsidies (targeted and non – targeted) raise over time.
- The pension reforms and increased working life will also have a benefits on potential growth. Such pension reform will lead to lower permanent transfer in the social area and it will increase the fiscal multiplier.

6. CONCLUSION
During the COVID 19 pandemic all governments in the world use fiscal packages to decide the health and economic crises. The public spending does not use only by this crises, but regular to stimulate the economic activity during the different stage of economic cycle. It requires the evaluation of effectiveness of public spending made. The appropriate measure is fiscal multiplier. This research uses the multiplier measuring changes of GDP by such public spending with one. This research calculates the fiscal multiplier in short run for Bulgaria for period 2008-2021. The research is implemented vector autoregressive (VAR) approache. It tested vector autoregressive model VAR(4) for Bulgaria for period 2008-2021.The fiscal multiplier for this period is **0.21**. It is with small value, but is statically significant. The Comparising with such multiplier calculated for the first decade after the transition, it has increased. Despite the low value, it is statistically significant and public spending influence on the Gross Domestic product. This instrument of fiscal policy could use for the stimulation of economic growth.

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REAL ESTATE IN BULGARIA FROM THE GLOBAL FINANCIAL CRISIS TO THE COVID-19 CRISIS - EFFECTS OF MACROPRUDENTIAL POLICY: EVIDENCE FROM BULGARIA

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ABSTRACT

Financial stability is a global public good. In order to overcome systemic risks and ensure financial stability, the modern regulation policy increasingly exploits the use of macroprudential instruments. For better coordination of economic interactions and alleviation of possible negative effects in the financial sphere, the aim is to adequately evaluate the instruments through the application of advanced methods of analysis in the management of systemic risk. In this regard, the application of macroprudential policies focused on the dynamics of the banking and other financial sectors to detect weaknesses, identify possible systemic risks and verify the stability of the financial system is of particular interest. In Bulgaria, the enhanced supervision focused on markets and sectors highly vulnerable to financial shocks and unpredictable risks is realized through the construction of an analytical system covering the relationships between significant structural determining factors, in which the introduction of a comprehensive macroprudential policy leads to a reduction of the emerging imbalances. In this regard, a set of macroprudential measures and the parameters measuring regulatory impacts in the real estate sector is defined as the object of the present study. The main thesis that the authors will try to prove is that the implementation of a macroprudential policy monitoring the interaction of financial markets and the real estate market is a key in preventing an asset price bubbles, mainly in the real estate sector, a credit bubble that led to excessive leverage and the zombification of the real estate sector.
Keywords: House price index, Random Forest Regression, Macroprudential regulation, Real Estate, Macroprudential policy, Zombification of the real estate

1. INTRODUCTION

In recent years, the purchase of real estate in Bulgaria is increasingly perceived as a "safe" option for investing available cash. Fluctuations in real estate prices are one of the key factors that lead to systemic risks for financial markets, cause economic crises and affect consumption. The intensity of global financial disasters (the financial crisis and the COVID-19 health crisis) and their effects have brought to the fore the essential importance of tracking the development of assets as potential sources of financial instability. The unsustainable rise and escalation of real estate prices in Bulgaria over the past 15 years has caused significant analytical interest, as well as fluctuations in commercial intentions.

This determines the consideration of two key issues related to the study of the factors influencing the dynamics of real estate prices and the importance of prudential measures to mitigate the effects and stabilize prices in the real estate sector. The paper examines in an empirical aspect the factor impact of key banking, macroeconomic, demographic and social indicators on the House Price Index in Bulgaria during the period from the beginning of the World Financial Crisis to the COVID-19 crisis. The relevance of the topic and the research undertaken is mainly due to the focus and warning set by the European Systemic Risk Board (ESRB (Official Journal of the European Union), 2022), which finds "that the presence of medium-term vulnerabilities in the real estate sector in Bulgaria is a source of systemic risk to financial stability, which may have serious negative consequences for the real economy. From a macroprudential perspective, the ESRB considers the main vulnerabilities to be the high growth in mortgage credit, signs of house price overvaluation and the absence of borrower-based measures that could mitigate the build-up of risks related to the sector". Based on this, the authors set a research task to try to identify the factors influencing the House Price Index by applying an algorithm for aggregate machine learning of data of the type Random Forest Regression and to make recommendations regarding the undertaking of new and the improvement of available macroprudential measures in Bulgaria. In this regard, the real estate sector in Bulgaria is defined as the object of the paper. The subject of the study is the set of macroprudential measures assessing the regulatory impact in the real estate sector. The aim of the study is to identify the key factors influencing the House Price Index and to assess the impact of macroprudential measures for their regulation and prevention of sectoral risks, based on the application of an advanced econometric model. The research thesis that the authors will try to prove is that the implementation of a macroprudential policy monitoring the interaction of financial markets and the real estate market is a key in preventing an asset price bubbles, mainly in the real estate sector and a credit bubble that could lead to excessive leverage and the zombification of the real estate sector.

2. REVIEW OF THE LITERATURE SOURCES ON THE TOPIC

The study of the effects of the factor impact on real estate prices and the significance of prudential measures to stabilize real estate prices and protect against risks has caused the interest of a number of researchers. In this regard, the review of the literary sources related to the topic will be divided into two parts. The first part is related to research covering the factors affecting real estate and in particular the House Price Index. The second one is related to a review of researches presenting macroprudential measures and their relation to the real estate sector. In this regard, *(Lo, et al., 2022)* examine the causal relationships between the price-to-rent ratio, as the most widely used measure of housing market conditions, and macroeconomic factors in the United Kingdom. The study examines the dynamics and sustainability of residential property prices and rents in collaboration with economic and financial determinants (money supply, inflation, currency markets, economic productivity, etc.). It is based on the methods of cointegration and revealing the causal relationships between selected indicators. The results show that the money supply, foreign exchange markets and the stock market are significant drivers of the price-to-rent ratio, as a consequence of which it can be used as an early measure to detect the effects of changes in macroprudential policies. *(Kuttner & Shim, 2012)* focus on policy measures designed to influence housing prices and housing credit in Asian countries. In the scope of their research, the authors examine in detail through the application of panel regressions the impact of non-interest rate monetary policies and changes in the amount of required reserves, as well as pay significant attention to fiscal policies and macroprudential measures relevant to the sector: maximum debt-service-to-income ratios, risk weights on mortgage loans, loan-loss provisioning rules. *(McQuinn, et al., 2021)* examine the existence of potential problems with access to credit among prospective homeowners arising from the

introduction of macroprudential measures in Ireland. Applying a microsimulation model to estimate the level of latent credit demand allows for an assessment of credit risk and macroprudential regulations. As a result, mortgage lending and equity instruments can be efficient, but can lead to higher real estate prices. In his research *(Wilhelmsson, 2022)* examines the effectiveness of borrower-based macroprudential instruments introduced by the Swedish Financial Supervisory Authority. Based on using microdata for the period 2008 to 2019 and applying hedonic regression with a regression discontinuity design (RDD), he concludes that the amortization requirement has a negative effect on house prices, while the mortgage loan-to-value (LTV) requirement has no effect on real estate prices. *(Qi, et al., 2022)* apply the mediating effect model to analyse the internal mechanism of the interaction between macroprudential policies and housing prices in China. As a result of the study, it is established that macroprudential policy cannot independently stabilize consumption demand directly and effectively, but also affect consumption indirectly through the intersection of real estate market and credit markets. The study of sources and available research on the subject-matter confirms the significance of conducting broad-based, but at the same time specialised analyses of the factor impact on real estate prices. Based on this, the potential of the real estate market and the impact of fiscal policies and macroprudential measures related to the sector could be assessed.

3. METHODOLOGY USED

Based on the review of the literature sources on the topic, it is evident that there are a number of variations for studying the influence of factors on the House Price Index. From a methodological point of view for the study of effects and assessment of factor impact, it is possible to use different combinations of macroeconomic (Zahariev, et al., 2020a), fiscal (Prodanov & Naydenov, 2020) (Pavlova-Banova, Mariyana, 2018), demographic, banking indicators (Zahariev, et al., 2022) (Prodanov, et al., 2022) etc. and their processing with basic and advanced analytical models. For the purposes of the research and the experience to extract maximum analytical information on the given problem, the authors focus on the application of a machine learning algorithm of the Random Forest Regression type (Kumar & Syed, 2021). It is characterised by excellent capacity and applicability to a wide range of issues for classification and regression predictive data modelling. In its most general form, the algorithm is a set of proposals for decisions to specific issues, taken on the basis of historical data by selected criteria. The algorithm creates "regression trees" with expected decisions for each of the specified criteria. Based on the derivation of their average value, a variant of the overall decision to the problem is generated. Visually, the process can be represented as follows:
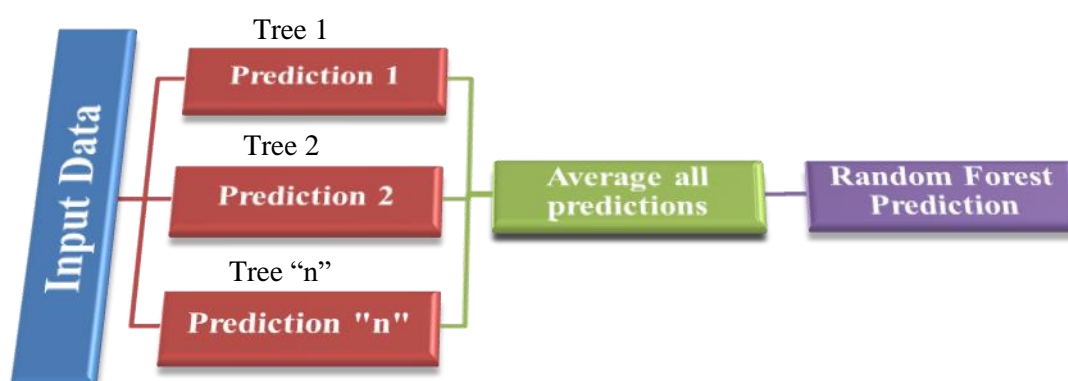
Figure 1: Random Forest Process
(Source: Authors' adaptation based on (The Click Reader, 2021))

The model (Breiman, 2001) emphasizes the internal evaluation of observed errors, strength, and correlation, in order to derive the responses of the variables.

Some advantages (Keboola, 2020) of the application of the algorithm are: the extremely high accuracy compared to other linear models, relatively easy application without the need for additional processing of the input data and last but not least the model allows a good interpretation of the results. The main disadvantages (Niklas, 2021) of Random Forest Regression are related to the fact that the large number of "trees" created can make the algorithm slow and inefficient for real-time predictions. The desire for a more correct prediction of the results requires the output of more regression trees, which leads to an increase the model development process. The output parameters on the basis of which the final statistical conclusions regarding the model can be drawn are regression coefficients measuring the relationship of each factor to the set dependent variable, as well as standard statistical measures: Mean Absolute Error (MAE), Mean Squared Error (MSE), Root Mean Squared Error (RMSE), Explained Variance Score, Max Error, Median Absolute Error, R^2. Each one of them has its own significance and relation for deriving the general conclusion from the completed model.
Mean Absolute Error (MAE) is a model evaluation indicator measuring the sum of the absolute difference between the actual and predicted values. It is calculated by the formula (Sammut & Webb, 2011):

$$MAE = \frac{\sum_{i=1}^{n} abs(y_i - \lambda(x_i))}{n}$$

where: y_i is the true target value for test instance x_i, $\lambda(x_i)$ is the predicted target value for test instance x_i, and n is the number of test instances.
Mean Squared Error (MSE) is used to evaluate the model and is calculated as the average squared difference between the observed and predicted values. Mathematical notation *(Frost, 2022)* is:

$$MSE = \frac{\sum(y_i - \hat{y}i)^2}{n}$$

where: y_i is the ith observed value, $\hat{y}_i$ is the corresponding predicted value, n is the number of observations.

Root Mean Squared Error (RMSE) is measured as the square root of Mean Squared Error (MSE) and is used as a measure to evaluate the model. Mathematically, it represents the "Euclidean distance between the vector of the true scores and the vector of the predicted scores, averaged by the square root of the number of data points". It is measured by the formula *(Github.io, 2022)*:

$$RMSE = \sqrt{\frac{\sum_{i=1}^{n}(y_i - \hat{y}I)^2}{n}}$$

where: y_i is the ith observed value, $\hat{y}_I$ is the corresponding predicted value, n is the number of observations.

Explained Variance Score measures the discrepancies between the model and the actual data. Practically, the higher amount of indicators shows the adequacy of the selected model and the conducted research. In order to be considered a correct performance and with good analytical value, the minimum value of Explained Variance Score *(Kharwal, 2022)* must be at least 60%. Max Error is a measure of the error between the predicted and originally used values.

Median Absolute Error calculates the loss based on the median of all absolute differences between the target and the prediction. Mathematically, it is defined as follows *(Bonnin, 2022)*:

$$\text{Med AE}(y, \hat{y}) = \text{median}(|y_1 - \hat{y}_1|, ..., |y_n - \hat{y}_n|),$$

where: y is the observed value, ŷ is the corresponding predicted value, n is the number of observations.

R^2 is a measure of the strength of the relationship between the model and the dependent variable, or how well the model works to explain changes in the dependent variables. It indicates the percentage of variance in the dependent variable that the independent variables collectively explain, ranging from 0% to 100%. The closer its value is to 100%, the better the model works through the given data. It is measured by the formula *(Turney, 2022)*:

$$R^2 = 1 + \frac{The\ sum\ of\ the\ squares\ of\ the\ residuals}{Total\ sum\ of\ squares}$$

Based on the systematised indicators, it is possible to draw final conclusions and findings from the performed algorithm for aggregate machine learning of data of the type Random Forest Regression, which in the present study will be applied to measure the factors affecting the House Price Index in Bulgaria.

4. EMPIRICAL RESULTS OF THE RESEARCH

For the purposes of the research, a large-scale database of over 50 indicators (independent variables) is used on a quarterly basis for the period 2007-2021, systematised from the official databases of: National Statistical Institute, BNB, Property Registry, Eurostat, Federal Reserve Bank of St. Louis, etc. Based on repeated application of the software functionalities for deriving the interrelationships, the Random Forest Regression model is mainly applied, which in comparisons with the Ordinary Least Squares Regression (OLS) performed in parallel at a later stage with a comparative purpose, describing the relationship between the independent quantifiers and the dependent variable (House Price Index) provides significantly better results and evidence needed to draw the specific conclusions. As a type of additive machine learning data model, Random Forest Regression allows, based on specific actions, to derive decision predictions from the aggregation of a series of basic regression models. Unlike linear models, it manages to capture the non-linear interaction between features and target. Given the study of the business environment in the field of real estate and based on the development *(Roleders, et al., 2022)*and variation sampling, the indicators used are limited to indicators having the maximum direct or indirect relationship on the dependent variable "House Price Index" and corresponding to the business logic relevant for the period. The selected indicators under study are as follows: GDP change compared to the previous quarter (gdp2(chng)); change in average income (avg_income(chng)); change in mortgage loan portfolio (mortg_volume(chng)); change in the number of mortgage loans (mortg_ctr(chng)); change in interest rates on mortgages (mortg_IR(chng)); unemployment (unempl(chng)); dummy variable to account for seasonality where available (Q1, Q2, Q3, Q4); variable to account for first unexpected lockdown caused by COVID-19 (pandemic) *(Zhelev, 2022)*; change in the deposit base (deposits(chng)); the spread between interest rates on deposits and inflation (deposit_hicp_spread); the interest rate on deposits (deposit_ir); inflation, compared to the corresponding quarter of the previous year (hicp2), sales of real estate (h_sells(chng)). For the purposes of preliminary derivation of the relationships between the selected indicators, a correlation matrix is built (Table 1).

	gdp2 (chng)	avg_income (chng)	mortg_volume (chng)	mortg_c tr (chng)	mortg_IR (chng)	Unempl (chng)	Deposits (chng)	deposit_hicp_spread	deposit_ir	hicp2	h_sells (chng)	h_index (chng)
gdp2 (chng)	1.000	0.163	0.194	0.116	-0.090	-0.363	0.210	-0.223	-0.095	0.156	0.126	0.493
avg_income (chng)	0.163	1.000	0.285	0.196	0.142	-0.021	0.074	-0.417	0.031	0.410	0.480	0.224
mortg_volume (chng)	0.194	0.285	1.000	0.949	0.298	-0.150	0.303	-0.670	0.152	0.718	0.069	0.472
mortg_c tr (chng)	0.116	0.196	0.949	1.000	0.313	-0.101	0.268	-0.520	0.290	0.657	0.020	0.298
mortg_IR (chng)	-0.090	0.142	0.298	0.313	1.000	0.042	0.095	-0.294	0.236	0.412	-0.033	-0.197
Unempl (chng)	-0.363	-0.021	-0.150	-0.101	0.042	1.000	0.005	0.137	0.225	0.001	-0.488	-0.332
Deposits (chng)	0.210	0.074	0.303	0.268	0.095	0.005	1.000	-0.194	0.301	0.356	0.005	0.218
deposit_hicp_spread	-0.223	-0.417	-0.670	-0.520	-0.294	0.137	-0.194	1.000	0.201	-0.826	-0.018	-0.559
deposit_ir	-0.095	0.031	0.152	0.290	0.236	0.225	0.301	0.201	1.000	0.386	0.007	-0.331
hicp2	0.156	0.410	0.718	0.657	0.412	0.001	0.356	-0.826	0.386	1.000	0.021	0.336
h_sells (chng)	0.126	0.480	0.069	0.020	-0.033	-0.488	0.005	-0.018	0.007	0.021	1.000	0.016
h_index (chng)	0.493	0.224	0.472	0.298	-0.197	-0.332	0.218	-0.559	-0.331	0.336	0.016	1.000

Table 1: Correlation matrix of the used indicators
(Source: Authors' calculations)

The results of the correlation analysis allow to take follow-up actions related to the selected indicators. In this regard, a random parameter search is performed among one hundred combinations and subjected to separation by cross-validation. The final model presentation based on the optimized parameters and checking for its explained variance against the validation sample can be presented as follows:

„RandomForestRegressor (n_estimators=782, min_samples_split=2, min_samples_leaf=1, max_features= 'auto', max_depth= 110, bootstrap= True, random_state=1)"

Based on the performed Random Forest Regression model, Figure 2 shows the final results and the influence of the selected coefficients:
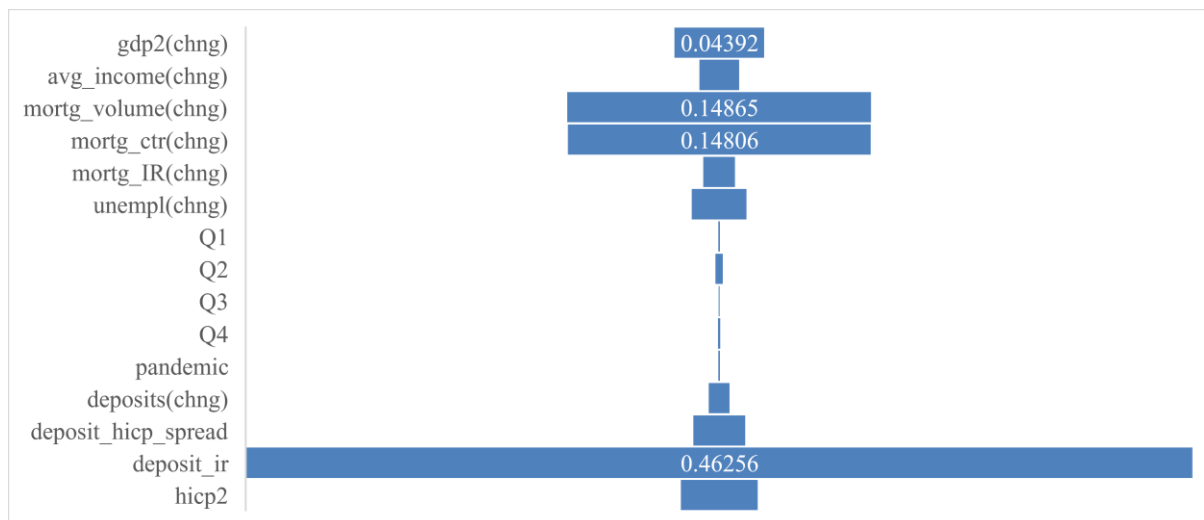
Figure 2: Random Forest Regression
(Source: Authors' calculations)

It can be seen that with the greatest significance for the change of the House Price Index in Bulgaria is the interest rate on deposits (deposit_ir), which affects 46.256%, followed by the change in the mortgage loan portfolio (mortg_volume(chng)) – 14.865%; change in the number of mortgage loans (mortg_ctr(chng)) – 14.806% and to a very small extent – the GDP change compared to the previous quarter (gdp2_(chng)) and inflation, compared to the corresponding quarter for the previous year (hicp2). The influence of all other indicators is minimal, and a low degree of seasonality of the changes in the house price index is also observed in the second quarter. For the purposes of the comparative presentation of the results of Random Forest Regression, it is also carried out the development of Ordinary Least Squares Regression, in which, however, the presence of multicollinearity is observed, which the model could not avoid. Due to its poor performance, no further processes will be carried out on its finalisation. To confirm the models built in this way, in Table 2 the statistical measures are systematized, based on which the results obtained from the two regression algorithms can be confirmed or rejected.

	Mean Absolute Error (MAE)	Mean Squared Error (MSE)	Root Mean Squared Error (RMSE)	Explained Variance Score	Max Error	Median Absolute Error	R^2
Random Forest Regression	0.01298	0.00028	0.01678	0.75291	0.03686	0.00953	0.70343
Ordinary Least Squares Regression	0.02442	0.00112	0.03344	-0.08114	0.09038	0.01848	-0.17752

Table 2: Statistical measures of the tested models
(Source: Authors' calculations)

The data from the table clearly show the significance of Random Forest Regression, where the following is observed: a high degree of adequacy from the performed algorithm (Explained Variance Score = 0.75291), low levels of Mean Squared Error (MSE = 0.00028) and a significant relationship between the selected model and the dependent variable (R2= 0.70343) Respectively, the indicators obtained in the Ordinary Least Squares Regression test categorically reject its usefulness in the specific situation. Based on the analytical approaches thus performed, for the categorical inference of the reliability of the results, a final summary of the optimised parameters is performed by measuring the cross-validation of the overall model, which shows 60.1% (13.3%) reliability of Random Forest Regression versus 8.5% (62.7%) of Ordinary Least Squares Regression as measured by Mean expl_variance: %.3f (%.3f)' % (scores.mean(), scores.std()). Random Forest Regression proves that to prevent the formation of an asset price bubble, mainly in the real estate sector, and a credit bubble that could lead to excessive leverage and the zombification of the real estate sector, it is necessary to undertake new and improve the available macroprudential measures related to the interest rate on deposits, the change in the portfolio of mortgage loans and the change in the number of mortgage loans.

5. CONCLUSION
Through the application of macroprudential policy, monitoring is performed on the interaction of the financial markets and the real estate market and the aim is to prevent the formation of an asset price bubble in the real estate sector, as well as a credit bubble. In an empirical aspect, the factor impact of key banking, macroeconomic, demographic and social indicators on the House Price Index in Bulgaria during the dynamic period from the beginning of the World Financial Crisis to the COVID-19 crisis is tested. Based on the applied Random Forest Regression model, the most important for the change in the Housing Price Index in Bulgaria is the interest rate on

deposits, followed by the change in the portfolio of mortgage loans, the change in the number of mortgage loans and to a much lesser extent – the change in GDP compared to the previous quarter and inflation compared to the corresponding quarter for the previous year. The ultimate goal of macroprudential measures – preventing the formation of an asset price bubble, mainly in the real estate sector and a credit bubble, requires the undertaking of new and the improvement of available macroprudential measures.

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ASSESSMENT OF THE STABILITY OF THE BULGARIAN BANKS WITH THE CAMEL RATING SYSTEM

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ABSTRACT
Banks are an essential part of the financial system of a country. The stability of the banking sector is of paramount importance for the achievement of stable and sustainable economic growth. Today's dynamic world offers more challenges and risks to banking institutions, which makes supervision and continuous assessment of the stability of the banking sector a must. The financial condition of banking institutions requires strict control, because the insolvency of even a single bank can have significant negative consequences on the entire economy. The purpose of the paper is, using the CAMEL model, to assess the financial stability of the Bulgarian banks with the largest market share (classified in the first group, according to the criteria of the Bulgarian National Bank) in the period before and during the crisis of COVID-19. The CAMEL rating system is internationally accepted and it is based on ratios used to assess banking institutions. It is considered one of the most effective supervisory techniques and ranks commercial banks based on their performance. The CAMEL model comprises five components represented by its acronym: Capital Adequacy (C), Asset Quality (A), Management Efficiency (M), Earning (E) and Liquidity (L). The study selects, calculates and analyzes some key ratios to assess the stability of commercial banks. The results obtained show that commercial banks are resilient and face the COVID-19 crisis with stable capital and liquidity positions.
Keywords: *banks, analysis, CAMEL*

1. INTRODUCTION
A strong banking sector is a prerequisite for the financial stability of an economy and increases its resilience to adverse macroeconomic shocks (Zahariev, Angelov, & Zarkova, 2022). At the same time, in the conditions of economic instability, there is an escalation of negative factors in the financial sphere. These circumstances require modern commercial banks to possess an adequate system for managing their financial stability, based on diagnostics of the financial condition of the bank. It is important to have transparent and objective information about the financial condition of banking institutions, with the help of which to assess and improve their financial performance. Today, the world is facing major challenges – the ongoing spread of the COVID-19 virus, the war in Ukraine, the energy crisis, which are triggering series of crises. In such periods, a number of banks face the risk of long-standing negative performance (Zahariev, Radulova, Aleksandrova, & Petrova, 2021). In the context of an increased level of risk, the objective assessment of the financial condition and regulation of the activity stand out as a serious challenge. In recent years, the assessment of the financial condition of the banking institutions as well as the improvement of their image as sustainable credit institutions, is based on ratings. "Most countries use the CAMEL system, an officially recognized rating system for banks that uses a score on a scale and is based on a combination of accounting and expert approaches." (Karpova, 2017).

2. RESEARCH METHODOLOGY
The policies pursued by banking institutions are at the heart of banking risk management. The competence of bank managers in this area requires in-depth knowledge of the regulatory

requirements for commercial banks and the laws of macroeconomic equilibrium (Zahariev, et al., 2020). Dynamic processes currently in the economy are a challenge for every manager (Ganchev, 2022). Banking practice pays close attention to the CAMEL rating system as a key framework for financial supervision and monitoring of banking institutions (Prodanov, Yaprakov, & Zarkova, 2022). CAMEL indicators examine the stability of banking institutions and help mitigate the potential risks that may lead to bank failure. The CAMEL system is an internationally recognized supervisory tool for assessing the soundness of financial institutions and is considered a modern and most appropriate approach for managerial and financial assessment of banks (Maude & Dogarawa, 2016). The Uniform Financial Institution Rating System (CAMEL) was introduced and adopted by the Federal Financial Institution Examination Council (US) in 1979, and in 1997 it was modified to include a sixth component - sensitivity to market risk (S). In 1988, the Basel Committee on Banking Supervision also proposed the CAMELS framework for assessment of financial institutions. (Rostami, 2015). The basic indicators are introduced following the methodology of the CAMEL system (Capital Adequacy, Asset Quality, Management Efficiency, Earnings Quality, Liquidity). The methodology the International Monetary Fund, regarding indicators of financial stability was also based on this principle. (International Monetary Fund, 2006).

2.1. Capital Adequacy

Capital Adequacy is one of the key indicators of the financial stability of banks and the banking sector. It is essential for banking institutions to have enough capital to be able to absorb unexpected losses. Capital reflects the overall financial condition of banking institutions; it is necessary to maintain the confidence of depositors and prevent the bank from going bankrupt. In the period of the global financial and economic crisis of 2008, capital adequacy changed its dynamics. As a result, on the one hand, the Bulgarian National Bank as the main regulator requires banks to increase their own capital. On the other hand, due to the created economic instability, there is a real danger of an increase in the share of non-performing loans, suppressing the credit activity of banking institutions, which on its own requires to maintain larger reserves. The mentioned reasons also lead to an increase in capital adequacy. For the purposes of the analysis, the indicator of total capital adequacy was used.

2.2. Asset Quality

The stability of commercial banks also largely depends on the quality of the assets they own. The quality of the assets, on its own, depends on the financial capabilities of the borrowers, especially in conditions of economic instability when the risk of non-performing loans is higher. The poor quality of the assets can result in bank bankruptcy. Therefore, it is important the banking institutions to react in a timely and adequate way, to identify the problem and take the necessary measures to resolve it. During the global crisis, the pressure on commercial banks was to reduce their external debts, and the full effect of this was felt in 2010, when credit quality deteriorated. The recession at the time had a rapid negative effect on bank asset quality and non-performing loan levels rose. The indicator used for the analysis is non-performing loans/total loan.

2.3. Management Efficiency

Management Efficiency is another important component of the CAMEL model, that provides for the growth and the survival of the banking institution. Although sound management is essential for the efficiency of commercial banks, it is difficult to measure. It is usually a qualitative measure that reveals the productivity and efficiency of human resources.

The ratio used to measure Management Efficiency is Revenue from Sales per Employee. It is calculated by dividing the Total Revenue from Sales by the Total Number of Employees. The higher is the ratio, the higher is Management Efficiency and vice versa.

2.4. Earnings Quality

Earnings Quality is also a very important criterion when evaluating banking activity. It determines the profitability of the banking institution and explains its sustainability and growth. On the one hand, an unprofitable financial institution can go bankrupt, and on the other hand, unusually high profitability can be a sign of excessive risk-taking by the bank. There are various indicators of profitability, for the purpose of the study the indicator Return on Assets was used.

2.5. Liquidity

Liquidity is another important aspect of the stability of banking institutions. With very low liquidity, banks will not be able to cover their short-term financial obligations. On the other hand, if they maintain very high liquidity this will adversely affect their profitability. This means that they are not using their funds properly, as highly liquid assets are almost zero yield. Therefore, financial institutions need to find an appropriate balance between liquidity and profitability in order to be able to generate a high financial result and at the same time provide liquidity. The indicator used for the purposes of the analysis is the ratio Liquid Assets to Total Assets, which measures the overall liquidity position of the banking institution.

3. INTERPRETATION OF THE RESULTS

The present study was conducted to assess the financial performance of the commercial banks from the first group (according to the ranking of the Bulgarian National Bank (Bulgarian National Bank, 2022): UniCredit Bulbank AD, DSK Bank AD, United Bulgarian Bank AD, Eurobank Bulgaria AD and First Investment Bank AD. The study is based primarily on secondary data, which was collected from the financial statements and annual reports of the the banks for the period from 2010 to 2021. The figures present the results for the banks from the assessment of the first group using the CAMEL model. First, for each bank a rating was set for every individual component, the average score for the whole period was calculated and compared to the average value of the indicator for the whole group. The rating scale was from one to three, as follows:

- Score 1 - the values of the indicator are below (lower) than the average for the group;
- Score 2 - the values of the indicator are close to the average for the group;
- Score 3 - the values of the indicator are above (higher) than the average for the group.

After that, the total score of each commercial bank was calculated for all indicators for the analyzed period, and based on this total score, the banks were assigned to one of three rating groups (minimum total score 5, maximum total score 15), as follows:

- Rating A – score 13 to score 15;
- Rating B – score 9 to score 12;
- Rating C – score 5 to score 8.

For the analysed period, UniCredit Bulbank AD is well above the minimum capital requirements. The positive changes in the capital adequacy values show that the banking institution has implemented the necessary measures to cover the constant increase in the risks it has taken. During the analyzed period, UniCredit Bulbank AD maintained values of the capital adequacy indicator close to and above the average for the group and received a comprehensive rating for the entire period of 2.67.

Despite the still unfavourable environment at the beginning of the analyzed period, DSK Bank AD managed to maintain a stable capital position. During the period, the bank has maintained a sufficient level of total capital adequacy (according to regulatory requirements) to cover the risks related to its activity. At the beginning of the period, the values were close to and above 20%, after which certain volatility is observed due to a decline in equity capital. In the period 2014-2018, the capital adequacy fell below the group average. At the end of the period and in the conditions of the COVID-19 crisis, DSK Bank AD reported capital adequacy well above regulatory requirements. The capital adequacy rating of the bank for the entire analyzed period is 1.92. In 2010, the capital adequacy of United Bulgarian Bank AD was slightly above the 12% minimum regulatory requirements. With the introduction of the new regulatory requirements in 2014, the capital adequacy of the bank recorded a significant increase - values around 27-28%. After that the level of capital adequacy fell to about 20%, which was also well above the required. For the analysed period, the United Bulgarian Bank AD is set a rating of 2.00 on this indicator. During the period of analysis, Eurobank Bulgaria AD maintained a stable capital position. After 2016, a decrease in capital adequacy was observed, as in 2019 the decline was due to the fact that Eurobank's capital base has covered a substantial increase in risk-weighted assets, as a result of the merger with Piraeus Bank Bulgaria AD. During the COVID crisis, the bank maintained capital adequacy of 20%, and this trend is expected to continue. The capital adequacy for the period is around the average for the group. On this indicator, Eurobank Bulgaria AD receives a general score of 1.71. For the period 2010-2021, First Investment Bank AD reported levels of capital adequacy above the minimum required, but lower than the average for the group. Despite the difficulties in the external environment related to the COVID-19 pandemic, the banking institution maintains a stable capital position. First Investment Bank AD, according to the capital adequacy indicator, receives a general score of 1. 20.
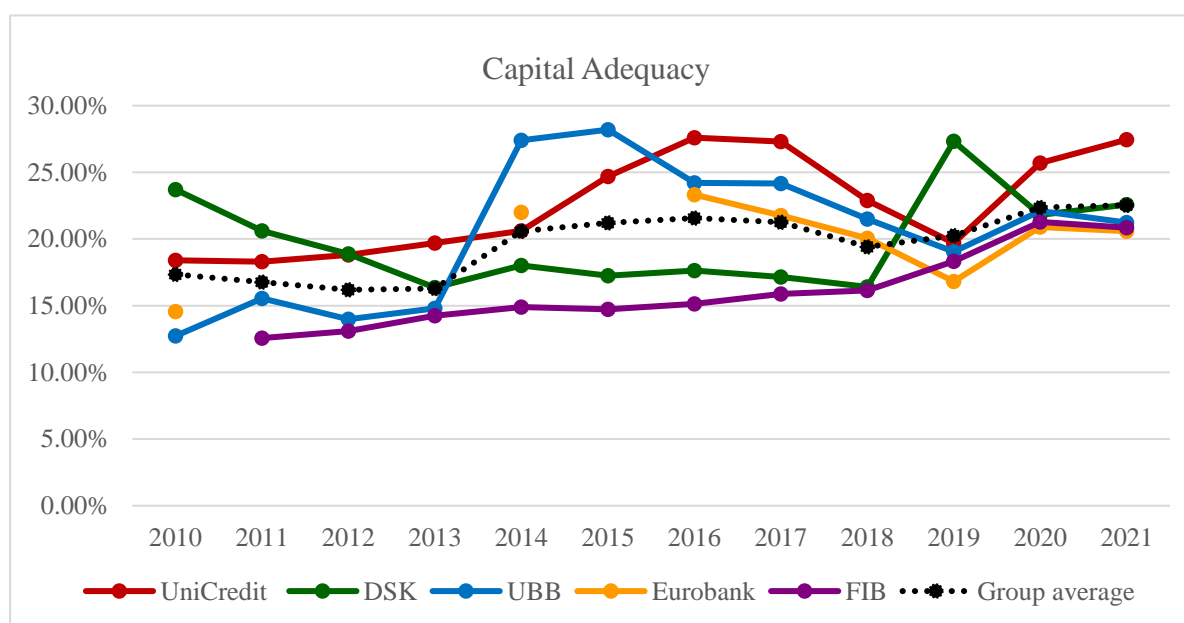
Figure 1: Assessment of the capital adequacy of the banks
(Source: Bulgarian National Bank and own calculations)

After 2010 the non-performing loans of UniCredit BulBank AD increased their level. In 2012 and 2013, the problems in most of the economic sectors continued, and along with the deteriorated financial condition of the economic agents and the instability of the real estate market, caused the continued increase in problem loans. Certain fluctuations are observed during the analysed period, the values of the indicator being around the average for the group.

In 2019, UniCredit Bulbank AD managed to reduce risk and further improve the quality of its assets. According to this indicator, the bank receives a general score for the analyzed period of 2.17. In terms of quality of assets, DSK Bank AD has maintained high values of the non-performing loans indicator in the years after the crisis. Compared to the other banks of the first group, it reports the highest value - around and over 20%. However, as a result of the implemented policy for nonperforming loans management, the commercial bank managed to significantly improve the dynamics in the quality of the loan portfolio. Thus, in 2017, it reported values of the indicator below 10%. In general, the values are at a level lower than that of the entire group. The general score of DSK Bank AD according to the indicator of non-performing loans is 1.67. The credit expansion in the years before 2008 and the negative consequences of the global financial crisis also affected the quality of the portfolio of United Bulgarian Bank AD. At the beginning of the period, the values of non-performing loans were high - about 19%. Owing to the bank's policy, for the period under review, non-performing loans decreased and reached values of 3-4%. There is a tendency to improve the indicator, which is likely to be maintained in the future. United Bulgarian Bank AD receives a general score of 2.55. The dynamics of the ratio of non-performing loans of Eurobank Bulgaria AD to the total amount of loans also evidences the impact of the financial crisis. The bank cleared loan portfolios of non-performing exposures, and as a result, the indicator decreased to 14.8% in 2017. For the period, a gradual decrease in non-performing loans was observed. During the COVID crisis, Eurobank Bulgaria AD has given to those of its customers who experience financial difficulties the opportunity to take advantage of the announced moratorium on payments. Thanks to the measures taken and the active work of the bank, the ratio of non-performing loans improved significantly to 6.5% in 2021. Despite the improvement, the indicator reports values higher than the average for the group, therefore the complex assessment of the bank in terms of asset quality for the analyzed period is 1.43. At the beginning of the analyzed period, First Investment Bank AD reported a low percentage of non-performing loans, compared to the percentage reported by other banks in the group for the same period. After that, a tendency towards deterioration of this indicator was observed, with its values in 2017 reaching 17.5%. Policy development is needed to reduce non-performing loans. On this indicator, First Investment Bank AD receives a general score of 1.80.
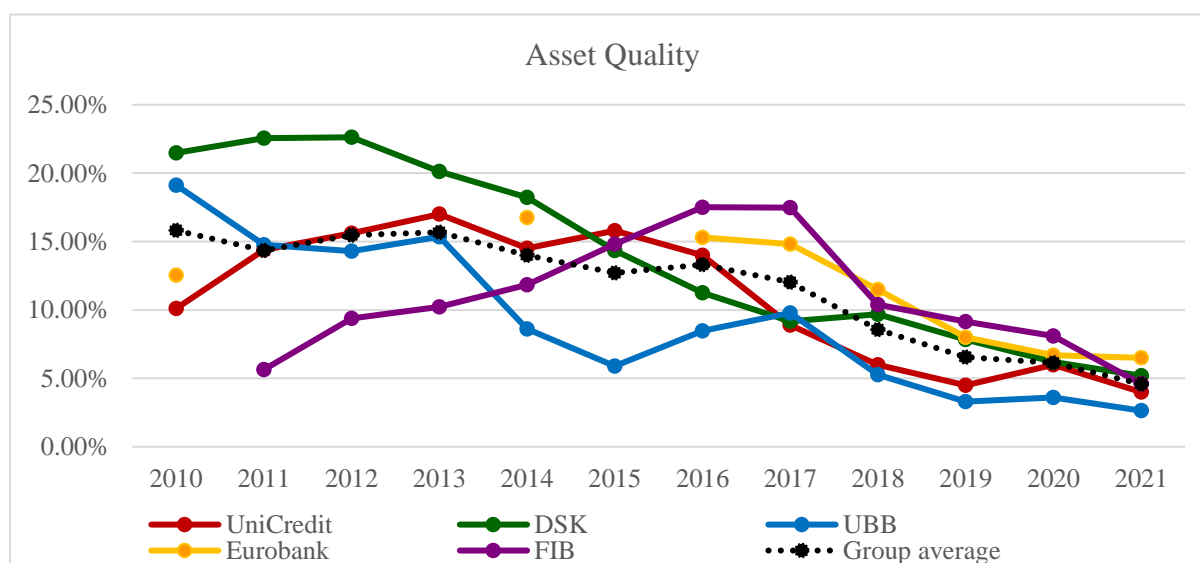
Figure 2: Assessment of the asset quality of the banks
(Source: Bulgarian National Bank and own calculations)

UniCredit Bulbank AD maintains good management efficiency. After 2017, the sales revenue per person decreased as the reason for this is the decline in total sales revenue and the higher number of employees in some of the years. In general, the trend is positive, and the values of the indicator are close to the averages for the group. The rating of the bank is 2.50. At the beginning of the period, the efficiency in the management of human resources of DSK Bank AD was high. After 2016, the trend was towards a decline, mainly due to a decrease in the income from interest on loans, and hence also the income from sales. Given this fact, the bank maintains values of the indicator above the average for the group. After the acquisition of Société Générale Expressbank AD, the sales revenues of DSK Bank AD went up, which led to the increase in management efficiency in 2020. Some fluctuations were observed during the period, but in general the rating of the bank on this indicator is high – 2.83. Certain instability is observed in the effectiveness of human resources management of the United Bulgarian Bank AD. The deterioration in 2015 was due to an increase in the number of employees, with the sales revenue being the same as in 2014. In 2018, management efficiency went further down, the main reason for this being the increase in the number of employees due to the acquisition of "CIBANK" AD at an insignificant increase in sales revenue. In most of the years the indicator values are close to the group averages. The general rating of United Bulgarian Bank AD is 2.18. The efficiency trend of human resources management in Eurobank Bulgaria AD tends to increase during the period 2010-2021. The acquisition of Alfa Bank Bulgaria AD has largely contributed to this. The acquisition of Bank Piraeus Bulgaria AD resulted an increase in the number of employees and an increase in sales revenues. The decline in the ratio in 2020 was due to a decrease in the number of employees. At the end of the analysed period, the values of the indicator are close to the average for the group and the commercial bank has a general rating for the period of 1.43. At the beginning of the analysed period, the values of the ratio of First Investment Bank AD were low, the reason for this being mostly due to the increase in sales revenues. In 2020 the management efficiency reported a slight decline owing to a decrease in sales revenues and an increase in the number of employees. Overall, the ratio is lower than the average for the group and First Investment Bank AD receives a lower rating for the period of 1.00.
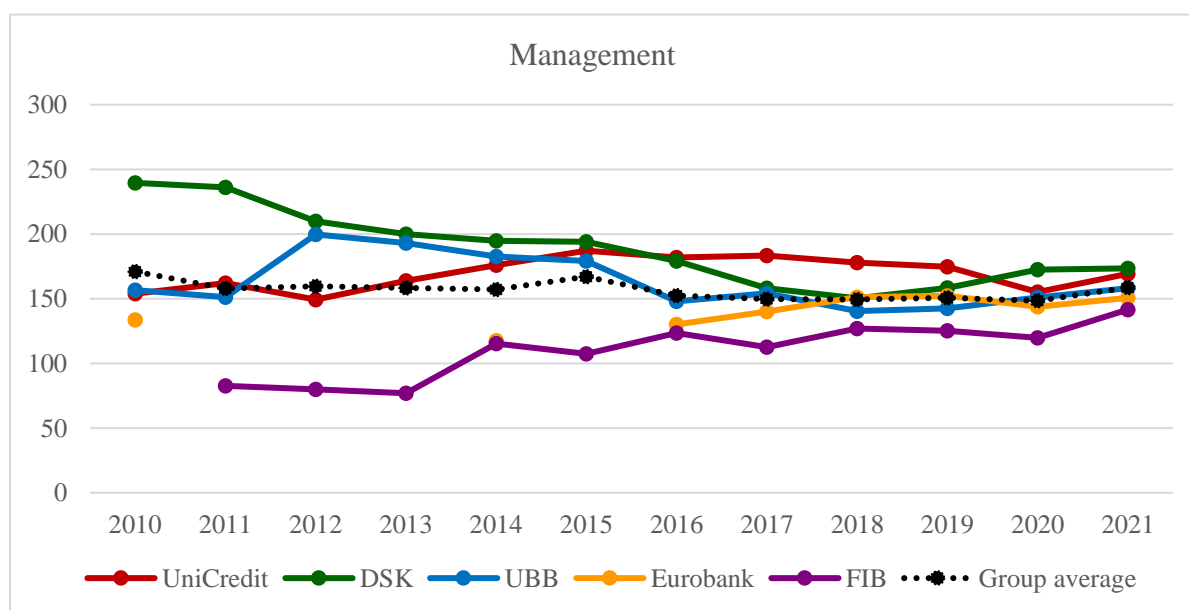
Figure 3: Assessment of the management of the banks
(Source: Bulgarian National Bank and own calculations [1])

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[1] The data used is presented in BGN thousand.

Independently from the deterioration of the quality of the loan portfolio and growing impairment costs, UniCredit Bulbank AD maintains a good level of profitability. In 2020, the return on assets was below 1%, which was due to a 47% drop in profit, compared to the previous year. In most years, the banking institution maintained profitability levels above the group average, the reason for which its general rating for the period is 2.50. At the beginning of the research period, except in 2011, DSK Bank AD maintained high values of return on assets. The negative consequences of the crisis have caused a decrease in profit, mainly due to the higher costs for depreciation of assets. In 2015, return on assets reached 2.75%, as a result of an increase in net income and lower impairment costs, which in turn gave a higher profit. In 2020, under the influence of the COVID crisis, the bank reported a decrease in profit compared to the previous year 2019, and this affected the return on assets. DSK Bank AD receives a high score for this indicator (2.58), as it reports values higher than the average for the group during most of the period under review. In the first years of the period, the profitability of the assets of United Bulgarian Bank AD was low, and in 2012 it was negative. The reasons for this are the lower interest income, the significant amount of provisions for non-performing loans and the loss generated in 2012. In 2017, the commercial bank again reported a negative return on assets, and the reason being the clearing of the loan portfolio, which led to a negative financial result. In 2020, additional provisions were made for expected credit losses resulting from the impact of the global pandemic which caused a decrease in ROA. The assessment of the commercial bank in terms of profitability is relatively low (1.27), owing to the fact that in the period 2010-2021 the level of the indicator was below the average of the group. The low ROA values of Eurobank Bulgaria AD in 2014 were the result of the less profit. In 2017 and 2018, the bank reported high financial results, which positively affected profitability. The pandemic had an impact on the bank's results. Uncertainty and the slowdown in economic activity reduced the demand for loans and hence profits. In 2020, the banking institution reported a lower profit compared to 2019 and therefore a lower ROA. There is some volatility on return on assets and the bank receives a rating of 2.55 for the period. In 2011 and 2012, First Investment Bank AD reported low ROA values. They were the result of the lower profit, the reduction of which was due to the low operating income realized in the conditions of the still unstable external environment. In 2013, there was an increase in profitability by 2%, owing to the profit from the transaction on the acquisition of Unionbank EAD. For the period under review, high volatility was observed and ROA values in most years were below the average values for the group. That is why the overall rating of First Investment Bank AD is relatively low - 1.40.
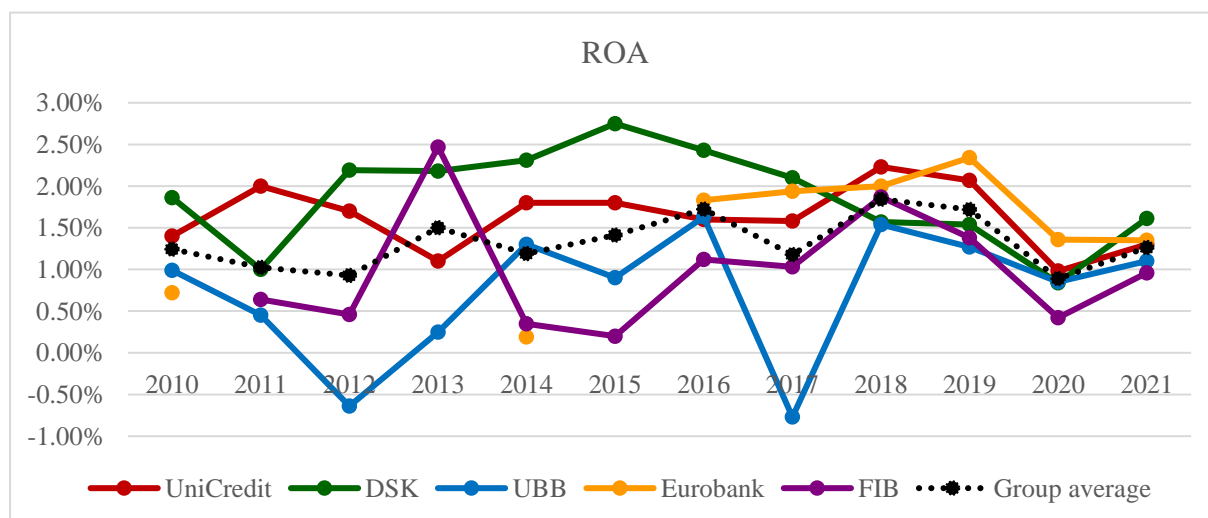
Figure 4: Assessment of the profitability of the banks
(Source: Bulgarian National Bank and own calculations)

The negative impact of the crisis also affects the liquidity of UniCredit Bulbank AD. In 2010 and 2011, low liquidity values of around 10% were observed, but with an upward trend. After 2014, there was a sharp increase in liquidity values, reaching up to and above 40%. This trend may be due to both an increase in lending and the transformation of some securities into higher-income assets. High liquidity is good for bank stability, but it also contributes to the generation of profitability-related risk. The impact of the COVID-19 pandemic on the liquidity of UniCredit Bulbank AD was insignificant, probably due to the conservative investment policy and the stable, largely independent of the wholesale market, funding profile. The trend observed in the bank's liquidity is relatively constant, and the values of the indicator from 2014-2021 are above the average for the group. This assigns to UniCredit Bulbank AD a relatively high rating for the period: 2.42. At the beginning of the period, the liquidity of DSK AD was low, around 10-11%, with an upward trend, significant after the crisis with Corporate Commercial Bank AD in 2014. In some of the years (2016, 2018), there existed a risk of excess liquidity, perhaps resulting from an accumulated excess of highly liquid but low-yielding assets. The COVID-19 crisis also had modest impact on DSK AD, the ratio of liquid assets being around 24%. On the liquidity indicator, the bank receives a rating for the period of 1.75. Unlike the previous two commercial banks, United Bulgarian Bank AD maintained higher values of the ratio of liquid assets at the beginning of the analysed period. A decline was observed in 2013 and 2014. A reason for the increase in the value of liquid assets, resp. liquidity, is also macroprudential policy of the banking sector regulator, which in 2014 required commercial banks to maintain larger liquidity buffers. The asset and liability management policy of the bank during the pandemic period infers that United Bulgarian Bank AD has the capacity to regularly and without delay fulfil its short-term obligations in a normal economic environment and in crisis conditions. In some of the reviewed years the liquidity level of the bank was below the group average. The rating of the bank on the liquidity component is 1.67. The liquidity of Eurobank Bulgaria AD for the period 2010-2021 had a constant trend, which is likely to remain in the future. In 2016, the bank's liquidity went up significantly, due to the increase in liquid assets. The acquisition of Bank Piraeus Bulgaria AD in 2019 had a positive effect on the bank's overall liquidity position. Eurobank Bulgaria. During the reporting year 2020, it did not experience a shortage of cash or other liquidity problems, as such are not expected to occur in the next financial year. In general, for the period, the bank's values of the indicator were below the average for the group and receives a rating of 1.38. After the crisis period, First Investment Bank AD maintained a high level of liquidity, for which contributed the increase in the volume of quick-liquid, but low-income assets. The reported decrease in 2013 is a consequence of the use of the available liquid assets after the acquisition of Unionbank EAD. In the following years, liquidity remained at high levels, owing to an increase in bank deposits and the still modest lending. In 2020, the ratio of liquid assets was high due to good risk management, the increasing deposit base and the measures taken to further strengthen bank liquidity to mitigate the consequences of COVID-19. For the period 2010-2021, according to the liquidity indicator, the banking institution receives a close to the average rating of 2.09.

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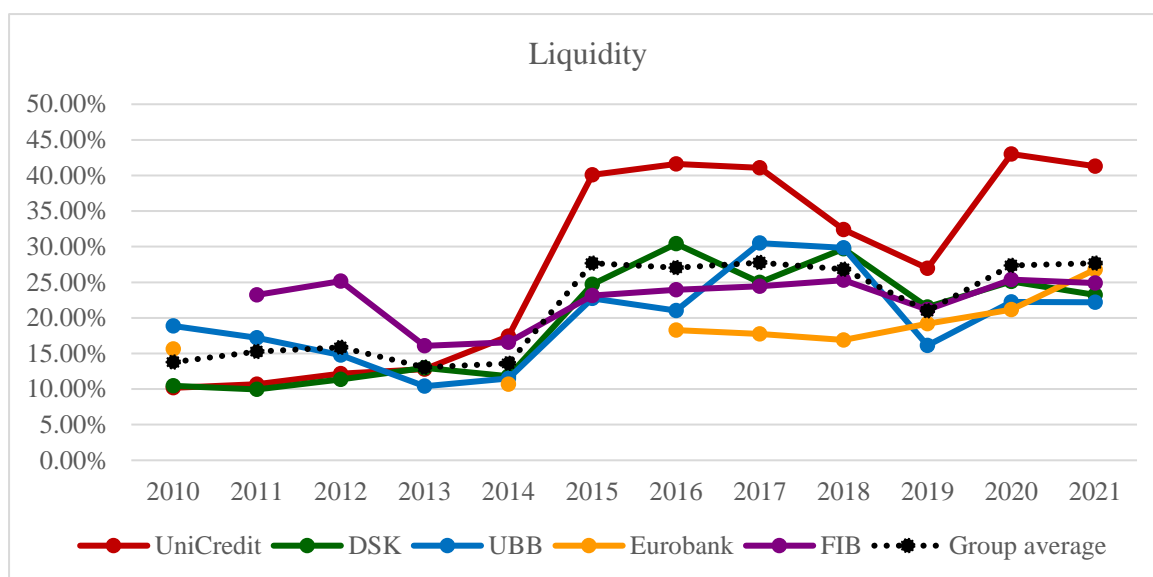
*Figure 5: Assessment of the liquidity of the banks
(Source: Bulgarian National Bank and own calculations)*

The following table presents the overall ranking of banks in therms of financial stability, obtained by averaging the scores, based on the CAMEL parameters. The results of the analysis show that the overall financial performance of UniCredit Bulbank AD is the best among the banks of the first group, followed by DSK Bank AD. United Bulgarian Bank AD takes the third position, Eurobank Bulgaria AD, the fourth and First Investment Bank AD comes last.

	Banks	**Unicredit**	**DSK**	**UBB**	**Eurobank**	**FIB**
Average score of the banks according to the relevant indicators for the analysed period	*Capital Adequacy*	2,73	2,08	2,17	1,88	1,27
	Asset Quality	2,17	1,58	2,58	1,38	1,82
	Management Efficiency	2,58	2,92	2,17	1,50	1,00
	Earnings Quality	2,67	2,67	1,33	2,38	1,45
	Liquidity	2,42	1,83	1,75	1,50	2,18
	Total score	**12,56**	**11,08**	**10,00**	**8,63**	**7,73**
	Rating	**B**	**B**	**B**	**C**	**C**

*Table 1: Final rating of the banks
(Source: own calculations)*

4. CONCLUSION
The stability of banking institutions and the banking sector is of key importance for the development of the economy. The rating systems create prerequisites for increasing public control over banks, their efficiency and stability, as well as for the implementation of adequate policies for their management. The proposed extended version of the rating system for evaluating commercial banks - CAMEL aims to performing an independent analysis of their condition, based on publicly available information. The conducted analysis gives us grounds to conclude that the Bulgarian banking sector is stable enough to meet the modern challenges to its activity. At the beginning of the analysed period, a deterioration of some of the indicators was noticed, followed by a gradual improvement. To a large extent, the reason for this was the negative impact of the World financial and economic crisis and the problems in the banking sectors of some of the EU countries. During the COVID-19 crisis, which had a negative impact on the global economy, the Bulgarian banking sector remained stable.

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OPPORTUNITIES FOR IMPROVING THE QUALITY OF TRAINING OF SPECIALISTS WITH HIGHER ACCOUNTING AND ECONOMIC EDUCATION

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ABSTRACT

The achieving of sustainable social and economic growth of the society in the modern-day dynamic world is linked with the need for highly qualified professionals, including in the field of accounting. The role of the higher education institutions in the pursuit of such an achievement is undoubtedly key and important. The Bologna Process endorsed the European Credit Transfer and Accumulation System (ECTS), the so-called "Student-centred Learning, Teaching and Assessment" (SCL). This idea changes the traditional concept of learners, transforming them in a natural way from users of the educational product to active participants in the creation and successful implementation thereof. Only in this way, in modern training conditions, the students will be able to get the opportunity to build their own flexible learning pathways in large parts of the institutional processes. The purpose of the present work is to define the state, problems and guidance to improve the quality of education in accounting disciplines in Bulgaria in the context of European and national priorities in the field of higher education. As a result of this research, innovative approaches are being developed and an attempt is made to introduce good practices in the training of accounting disciplines. The restrictive conditions stem from the focus of the study, which is placed on the training in the Bachelor's degree on accounting. The study has elements of a static research. Statistical toolkit and analysis are applied. In parallel, a dynamic study was also carried out. The structured interview methodology is used. As a result of the research, important guidelines for changes in the organizational environment and educational documentation in higher schools in Bulgaria have been visualized, with the help of which to support the processes of the successful implementation of current trends and innovative educational practices to increase the quality of training in accounting disciplines in Bachelor's degree with the aim of successful professional realization of the trainees.
Keywords: Accounting training, Bachelor's degree, Bologna process, ECTS (European Credit Transfer and Accumulation System), SCL (Student-centred learning, teaching and assessment)

1. INTRODUCTION
The decade of challenges – transitions, changes, novelties and categorical support for the development of the EU economies, business, education, ecology, culture. Every responsible society today should deeply consider all these issues with a focus on the quality of educational products, the digitization of educational processes, the application of ICT in the implementation of innovative educational products and projects, career paths, open science - in general, the overall vision of higher education tomorrow, because "knowledge itself is power" (Francis

Bacon), and the university is the workshop that shapes the thought of the younger generation, it must be held very firmly if we do not want to let the future slip from our hands (Henri Barbès). And of course sustainability – the sustainability is an important part of a smart strategy for developing lifelong learning skills. The purpose of this scientific research is to analyze the trends in the European Higher Education Area, including in the field of accounting. For their implementation, the following tasks are set out: Analyzing options to improve the quality of educational products and the success of specialists with higher accounting and economic education in the labor market, integrating the active role of accounting students in the choice of their personal educational pathways according to business needs, research the positives for student and for teacher mobility, exploring the prospects for digitalization and the development of innovation in the field of higher accounting education. The subject of the present study is the issues related to the Credit Transfer and Accumulation System (ECTS). The focus of the study is the current needs of the higher education system in the context of strengthening and strategic development of European higher education. In the course of the research, the thesis is substantiated that under modern conditions, characterized by dynamics in the planning and development of innovations in the field of higher education, the mass digitization of communications and the virtualization of forms of education in the last two or three years, the successful implementation of the educational artificial intelligence strategy for the digital transformation, all barriers and limitations in terms of knowledge, science, research and access to higher education should be eliminated at the expense of developing emotional intelligence and acquisition of key competencies by learners, launching the highly competitive educational products and strong motivation of higher schools and the European Student Union for joint work and cooperation in the common European educational space.

2. LITERATURE REVIEW
The opportunities of strengthening the European dimensions in the course of the training of specialists with higher accounting and economic education have been discussed at numerous international and national forums by foreign and Bulgarian scientists such as R. Gray, D. Collison, C. Ghitulica, T. Djukic, C. Favino, M. Albaz, D. Feschiyan, Sn. Basheva, N. Kostova, F. Filipova, St. Stefanov, G. Iliev and many others. In addition to the author's ideas and proposals for the purposes of this research, important European strategic documents and legal acts were also studied, including: Official Journal of the European Union, Sorbonne Declaration, Bologna Declaration, Council Resolution on a strategic framework for European cooperation in the field of Education and Training with a view to the European Education Area and beyond (2021-2030), official government press releases on interstate relations respectively in: Prague - 2001, Berlin - 2003, Bergen - 2005, London - 2007, Leuven - 2009, Bucharest - 2012, Yerevan - 2015, Paris - 2018, Rome - 2020, Guide to ECTS, Analysis of the European Student Union, Law on Higher Education in the Republic of Bulgaria, Regulations for the Implementation of the Law on Higher Education in the Republic of Bulgaria, as all of them are a good basis for carrying out the set research tasks.

3. RESEARCH METHODOLOGY
The study has elements of scientifical static research. An analysis of important European and national strategic documents and legal acts is attached. The results of the research are expressed in a description and analysis of the European policies and activities in the field of higher education in the Bachelor's degree and the national policies and activities in the field of higher education in the Bachelor's degree.

4. RESEARCH OF EUROPEAN POLICIES AND ACTIVITIES IN THE FIELD OF HIGHER EDUCATION AT BACHELOR'S DEGREE

Higher education plays a key role in the process of the global future-building process. Its problems are the focus of global organizations and it therefore among the 17 Sustainable Development Goals of the United Nations. The European Union responds to this call, and through its bodies and activities, efforts are made to continuously improve it.

4.1. Policies and activities of the European Commission

Higher education has been a key priority in the work of the bodies of the European Union since its establishment. The European Commission initiative "EEA - European Education Area" helps Member States of the Union work together to build more sustainable and inclusive education and training systems at all levels (European Education Area, 2022). Higher education issues are central to the adopted Council Resolution on a strategic framework for European cooperation in education and training with a view to the European Education Area and beyond (2021-2030) **(Council of the European Union, 2021)**. The strategy paper commits the EC and the European institutions by 2030 to realize their activities and policies in the field of higher education, including in the Bachelor's degree, according to the following priorities:

- *Improving the quality, equality, inclusion and success for all in education and training* – this is expressed in improving access, equality, quality and flexibility of training (including in accounting) for all learners with the aim of reducing social, economic and cultural inequalities, incl. and by developing digital skills and competencies;
- *Making lifelong learning and mobility a reality for all* – this is involved in providing learning opportunities (including in accounting) for persons of all groups adapted to their individual needs, including by stimulating innovation and ensuring passability and flexibility between different learning pathways in the Bachelor's degree (including accounting specialties), application of new educational approaches, as well as validation of non-formal and informal learning, automatic mutual recognition of qualifications and study periods abroad and quality assurance;
- *Improving competences and increasing motivation in the educational profession* - attention is paid to the well-being, satisfaction, quality of teaching (including in accounting) and motivation of academic staff, which is an important factor for the quality of education and training (including in accounting);
- *Strengthening European higher education* – promoting the demand and implementation of new forms of deeper cooperation between higher education institutions (including the professional field of Economics, accredited to train students in the Bachelor's degree), in particular through the establishment of transnational alliances, pooling knowledge and resources, and creating more opportunities for mobility and participation of students and staff, as well as promoting research and innovation, including through the full deployment of the European Universities Initiative;
- *Supporting the ecological and digital transition in and through education and training* - including the environmental and digital dimension in the organizational development of education and training institutions (including in accounting), which will serve as a catalyst for the process by making investments in eco-systems for digital education to ensure the prospect of environmental sustainability and digital skills at all levels and types of education and training, including the Bachelor's degree (including in relation to accountancy).

4.2. The Bologna Process and the European Higher Education Area

For the past three decades, we have seen the ongoing Bologna process, which reflects the common ideas and policies of the countries of Europe in the field of higher education. The purpose of this process is to build synergies and cooperation mechanisms in the field of higher

education to increase the social and economic well-being of the Member States through the creation of the European Higher Education Area (EHEA). Today it includes the European Commission and 51 countries, with Bulgaria's membership dating back to 1999. The process takes place through numerous initiatives, reforms and activities on the basis of the consistent signature of a number of documents and strategies. They set objectives, add participating countries and take into account their efforts in the pursuit of continuous improvement of the quality and mobility of training in higher education. The EC's efforts in the context of the Bologna process have led to the strengthening of undergraduate education at the intersection between European higher education fields, labor market expectations and research. Reaching this stage of the reform is connected with the successive preparation of numerous European strategic documents and normative acts, which process took place in the following sequence:

- *Sorbonne Declaration* - signed on May 25th 1998 in Paris by the Ministers of Education of France, Germany, Italy and Great Britain. The Sorbonne Declaration emphasizes: progressive convergence of the common frameworks of educational degrees and cycles in a common European Higher Education Area; general system of all educational degrees: bachelor's, master's and doctoral student; increasing and promoting student and teacher mobility (students to spend at least one semester abroad); removing barriers to mobility and improving internal systems for the recognition of academic degrees and qualifications and the use of credits (Sorbonne Declaration , 1998).

- *Bologna Declaration* - signed ot June 19th 1999 г. in Bolgna, Italy by the Ministers of Education of 29 European countries. The Bologna declaration by European Ministers of Education on the European Higher Education Area is based on the understanding that "a Europe of knowledge is now widely recognized as an indispensable factor for social and human growth and as an indispensable component for the consolidation and enrichment of European citizenship, capable of providing its citizens the necessary competences to face the challenges of the new millennium, together with an awareness of shared values and belonging to a common social and cultural space. The importance of education and educational cooperation for the development and strengthening of stable, peaceful and democratic societies is universally recognized as paramount." The Bologna Declaration sets clear goals: an understandable and comparable system of higher education; adopting a system involving two main cycles; introduction of Educational Credit System (ECTS); enhancing mobility; strengthening cooperation in the field of quality assessment; strengthening the European dimensions in the higher education. The Bologna Declaration rejects barriers and boundaries to knowledge. It sets a significant goal - cooperation and a sense of empathy throughout the European knowledge and science domain, trust between systems, motivation for higher and stronger education and research, cooperation with employers and creating transparency for the whole society (Bologna Declaration, 1999);

- *Regular conferences and ministerial communiques* – Every few years, the education ministers of the EU countries hold joint conferences, which successively set targets, attract new participating countries and strengthen efforts towards the continuous improvement of the EHEA as a result of the Bologna process. In chronological order, the strategic documents are the Communiqués of Prague (2001), Berlin (2003), Bergen (2005), London (2007), Leuven (2009), Bucharest (2012), Yerevan (2015), Paris (2018) and Rome (2020). These strategic documents reflect in a peculiar way the agenda of the process, in which the problems of undergraduate education occupy a key place, in various directions, and the results are reflected in the so-called reports on the implementation of the Bologna process in ENEA. The executive structure between the Ministerial Conferences is the Bologna Follow-Up Group (BFUG).

Until 2030, the goals set for ENEA according to the latest Rome Ministerial Communiqué of 2020 are the following:

- to be an area where students, staff and graduates can move freely to study, teach and do research;
- fully respect the fundamental values of higher education and democracy and the rule of law;
- to encourage creativity and critical thinking;
- continuously expanding the opportunities offered by technological development for training and teaching based on scientific research;
- to offer all learners equal opportunities in line with their potential and aspirations;
- to offer opportunities for upskilling and retraining in a lifelong learning perspective;
- to be a key player in achieving the UN Sustainable Development Goals by 2030. (Ghitulica, 2020).

The subject of the present study are the issues related to the Credit Transfer and Accumulation System (ECTS). This topic is discussed at all conferences of European Ministers of Education and is reflected in the communiqué (see Figure 1).
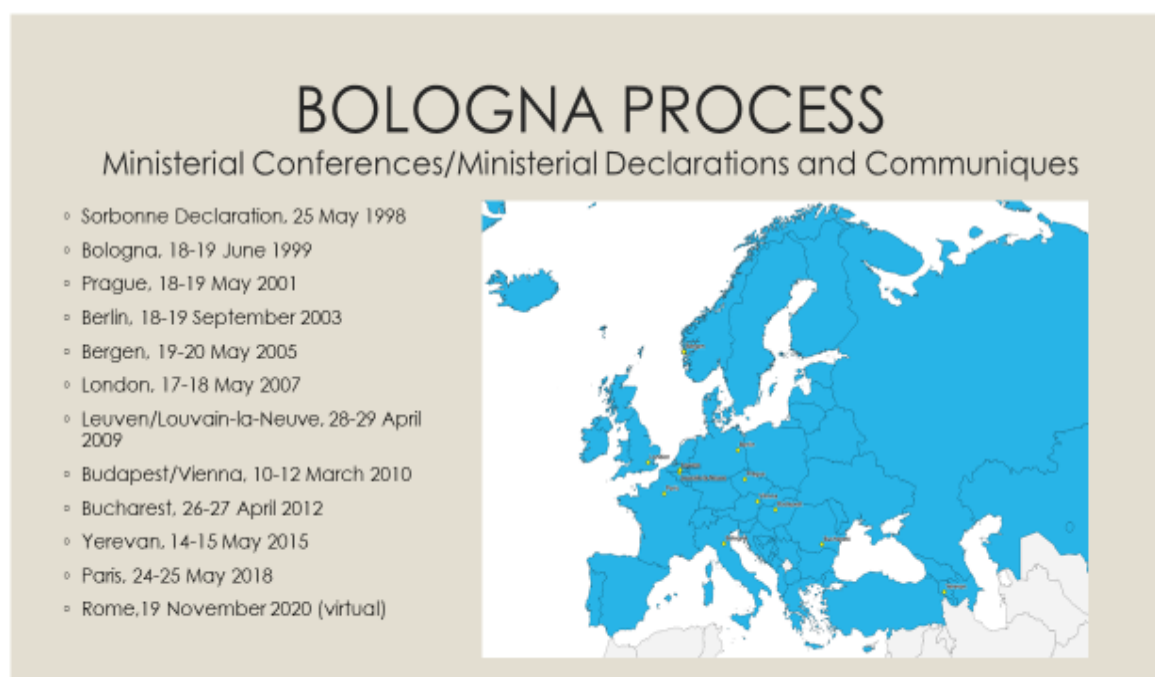
Figure 1: Ministerial Conferences, Declaration and Communiques in Bologna Process
(Source: http://ehea.info)

ECTS is based on regular study courses and, taking into account the study load, including the time for lectures, exercises and exams, credits are awarded, which are given only after completion of the course. For one full year of study, 60 credits are awarded (30 credits per semester or 20 credits per trimester), which means that a completed bachelor's degree can be obtained for 180 to 240 credits depending on the length of study. The development of the ECTS theme begins with the idea of using credits in higher education in 1998-1999, through the possibility of adding loans to the 2001 Diploma Supplement, for the consistent use of instruments and practices for the accumulation and recognition of credits within the EU since 2007. In 2009 ECTS is recognized as a key instrument of the Bologna Process, whose objectives are to increase the flexibility of the learning process, to strengthen academic mobility, to guarantee the recognition of degrees between universities, to overcome the drop out from the

learning process and to provide a lifelong learning. At the next stage, from 2012, the idea arises that the credits awarded will be linked to the achieved learning results, and in 2015 the EU published a Guide to ECTS. (ECTS users' guide 2015, 2015).

4.3. European University Association

The focus on the Bachelor's degree has committed the community's efforts and set up numerous organizational structures, specific strategies and policies, normative documents. The European University Association (EUA), established in 2001, has a leading role in the field of undergraduate education reforms in Europe. The association brings together over 800 European universities and rectors' councils with over 20 million students, strongly encouraging the cooperation and the exchange of good practices between them (see Figure 2).
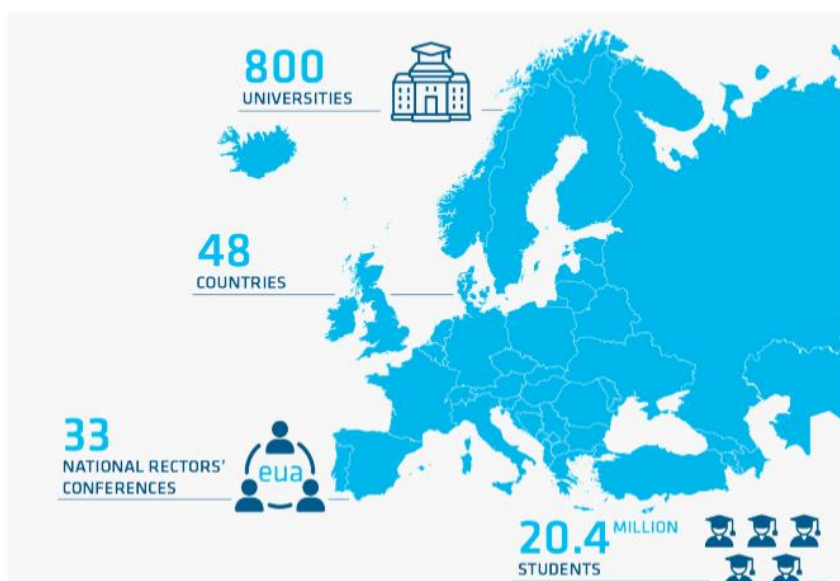
Figure 2: Members of The European University Association (EUA)
(Source: https://eua.eu/downloads/publications/2021%20annual%20report.pdf)

The main highlights of the services the EUA offers to its individual and collective members are:

- Strengthening the role of universities in shaping the single European educational and research area, building policy and project development;
- Offering services and implementing projects on key issues to enhance the quality and shape the European profile of universities;
- Introducing the European dimension in higher education and improving the flow of information through the organizing of meetings and conferences, preparing and publishing analyzes of current trends and disseminating of good practices;
- Providing support for a common policy implementation, promoting cooperation and transparency of European higher education on a global scale.

4.4. European Students's Union

EUA's efforts are also supported by the European Students' Union (Union-ESU), the organization that brings together 45 national student unions from 39 countries, including Bulgaria, by promoting the educational, social, economic and cultural interests of students at European level. Following each ministerial conference from Berlin, 2003 to the present, the ESU publishes an analysis of the Bologna process, which is part of the stakeholder

communication and a number of political documents. These political documents clarify the position of students representatives as part of the topics considered by the BFUG, including student-centered learning and teaching (SCL). In the ESU analysis " Bologna with Student Eyes 2012 " the focus is on the features of SCL (Bologna with Student Eyes, 2012). The document clarifies SCL for the first time, introducing it as "a philosophical approach to education that puts the needs and voice of the learner at the centre", where students are seen as active participants in their education and personal development. This is achieved by focusing on relationships, encouraging creative thinking and empowering students in the learning process. The main elements of student-centred learning are: flexible learning paths based on learning outcomes; student participation in curriculum development; focus on the individual learner and the importance of learning to learn; portfolio assessment models; interactive learning process that includes peer learning; enhanced individual counseling with students. All these elements are aimed at increasing the flexibility and efficiency of the higher education system. Bulgaria is an equal member country of the EHEA and all its efforts, legal basis, structures and representations in international organizations and initiatives fully correspond to the ideas of the Bologna Process, including with regard to studies at the Bachelor's degree.

5. STUDY OF NATIONAL POLICIES AND ACTIVITIES IN THE FIELD OF HIGHER EDUCATION IN BACHELOR'S DEGREE

Bulgaria is part of the European Higher Education Area (EHEA), involving 49 countries with different socio-economic development, cultural and historical features and academic traditions in the field of higher education. Its members apply good practices and guidelines for high quality higher education within the European area, organizing group meetings and events, working on various topics. Therefore, ... countries, institutions and stakeholders of the European space are continuously adapting their higher education systems, making them more compatible and strengthening their quality assurance mechanisms. For all these countries, the main objective is to increase the mobility of teachers and students (including those who teach and are trained in accounting disciplines) and to facilitate employability (Bologna Declaration, 1999). In order to assess progress and decide on the future development of higher education within the framework of the EHEA, group meetings, events and conferences are organized. This ensures convergence and harmonization of higher education systems. This is related to:

- academic autonomy and freedom of higher schools, implementing reforms in individual countries to improve the quality of education (including in accounting);
- establishment of independent student organizations for the development of the academic spirit, preservation of academic traditions and introduction of innovations and information technologies in the educational process (including in accounting disciplines);
- increasing the mobility of teachers, students and staff through free movement within the academic European space;
- recognition of qualifications from one country to another by developing and implementing institutional level strategies;
- lifelong learning is linked to the creating of flexible curricula and student-centered programmes;
- stimulation of scientific research and introduction of innovations in the educational process (including in accounting disciplines);
- three-level training level:
  - a first cycle, which includes undergraduate studies with an accumulation of 240 credits (ECTS);
  - a second cycle, which applies to master's studies and respectively 60/66 - 120 credits (ECTS), respectively, this range is formed through the Qualifications Framework for the European Higher Education Area;

- a third cycle related to doctoral studies, respectively the goal is the writing and successful defense of a dissertation;
- social dimension - all students should have equal opportunities to access, conditions and completion of education and financial support.

Under the auspices of the European Higher Education Area, in cooperation with the European Student Union (ESU), various projects and sessions are developed and implemented, such as (European Students` Union, 2022):

- *the recognition of qualifications for refugees and migrants without official documents.* The project consortium includes countries such as: Norway, the Netherlands, Malta, Italy, Greece, etc. Within the project were developed e-learning materials and were held webinars, briefings and workshops between universities. It was introduced a common approach to the recognition of qualifications by the host country, using a diverse set of admission procedures, obtaining accessible information about the education systems in Yemen, Burundi, Rwanda and others.
- *social inclusion and common values, the contribution of education and training (SMILE).* This project integrates innovative tools and approaches to the training of academic and non-academic staff. The project aims to train students with a migrant background; increasing the role of women as leaders in education; problems and prospects for students with low social status. The project results in the development of a course and the introduction of policies in higher schools to support students in different socio-economic situations for good professional implementation.
- *leadership and organization of teaching and learning in European universities (LOTUS).* Ministries, universities, university associations, student and staff unions participate in the project. At various scientific forums, they discuss strategic changes in training and teaching in higher education institutions in Europe.
- *Involving of non-traditional students in vocational higher education (InclusiPHE).* This contributes to the creation of a more inclusive environment in PHEI, by creating a set of innovations aimed at increasing the number of so-called "non-traditional students". These are "people of the third age", students with disabilities and others. In partnership with the International Youth Health Organisation, a research session entitled "Manifesto for Student Mental Health" was organized. In order to obtain a quality education, it is necessary to implement sound mental health policies, aiming the improvement of the well-being. The main objective of the action is to support student representatives to improve mental health and by implementing policies at the national level. Therefore, by participating in the European Higher Education Area (EHEA) in Bulgarian higher education institutions have some positive effects and successfully achieves following goals:
  - harmonization of qualification frameworks with the aim of increasing the quality of education (including accounting) through the introduction of European educational programs;
  - implement reforms to synchronize the educational process in the Bachelor's degree of the Higher Education (including in relation to the accountancy disciplines) with European norms;
  - implementation of changes in the normative acts for synchronizing academic standards in student education (including accounting disciplines);
  - acquisition of key competences and skills related to participation in the academic life and management of the higher education institution and decision-making at various levels (see Figure 3).
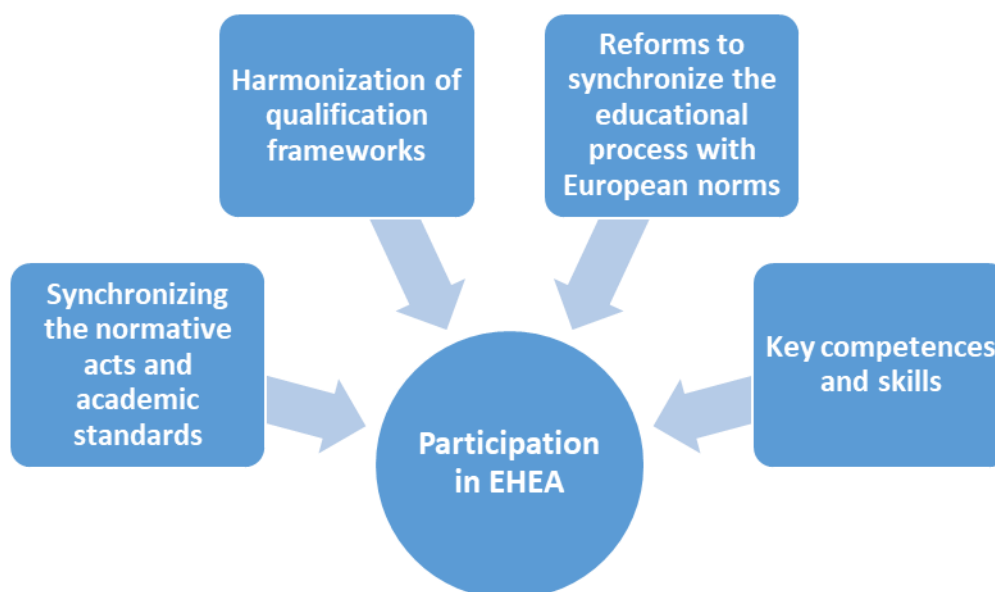
*Figure 3: Positive effects of the participation of Bulgarian higher education institutions in the
European Higher Education Area
(Source: http://www.ehea.info/)*

It should be noted that higher education in Bulgaria is in sync with the perspectives laid down in current strategic documents at the global and European level. A Law on Higher Education has been adopted in Bulgaria (Law on Higher Education in Republic of Bulgaria, 2022). The Law organizes the structure, functions, management and financing of higher education in the Republic of Bulgaria. Based on the Law, Regulations for its implementation are being developed. Higher education institutions, complying with the legislation of Bulgaria, also develop internal normative acts such as regulations for: the organization of the educational process, the admission of students to the Bachelor's and Master's degrees, the activities of the higher school, academic mentoring, the development of the academic staff, the systems for quality and others.

6. CONCLUSION

The needs of building highly qualified specialists with higher accounting and economic education, able to manage the new requirements and challenges of tomorrow, which respectively are able to contribute to the development of the domestic economy, leads to an increase in the requirements for their training and vocational preparation. In order to improve the quality and modernize training in accordance with European requirements, the following steps are necessary: timely updating of curricula, conclusion of contracts between higher education institutions and enterprises, verification of the acquired knowledge and skills of trainees by conducting student practices and internships, practical training of students in a real working environment, development of a career guidance system, active participation of students in the research activities of higher schools, introduction of various incentives for student achievements. In conclusion, the analyzed good European university practices, innovative educational models and ideas are aimed at helping specialists with higher accounting and economic education in Bulgaria to build durable skills for lifelong learning, for effective search for up-to-date information and active participation in educational and workflows today and in the future. Only in this way will they grow fully as learners, part of the European Education Area and be citizens of Europe and the world, capable of living independently and responsibly.

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THE SUSTAINABLE ENERGY DEVELOPMENT OF BULGARIA WITH A HORIZON TO 2050: THE ROLE OF INNOVATION AND TECHNOLOGY

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ABSTRACT

In the Strategy for Sustainable Energy Development of the Republic of Bulgaria until 2030, with a horizon to 2050, various solutions are proposed for the achievement of the Bulgarian national goals and interests within the framework of the European Energy Union. One of them envisions changes in the overall energy model through the implementation of innovative technologies for sustainable energy development. In every decade since the Brundtland Report was first published in late 1980s, there was a surge of interest from governments to promote innovative and entrepreneurial activity in the area of sustainability through legal measures and financing. This report explores the Bulgarian national goals and policies set out in the Strategy in the context of current state and development trends of the innovation environment in Bulgaria.
Keywords: *Bulgarian energy strategy 2030, Entrepreneurial activity, European Energy Union, Innovative technologies, Sustainable Energy Development*

1. INTRODUCTION

There is an increasing demand on our society for transformational changes, urged by different actors and triggered by events, some of them foreseen decades ago, and some less expected. The *Brundtland Report* from 1987 highlighted 'the serious probability of climate change generated by the 'greenhouse effect' of gases emitted to the atmosphere, the most important of which is carbon dioxide (CO_2) produced from the combustion of fossil fuels' (*Brundtland, 1987)*. Societies slowly started thinking about the 'probable' crisis, tackling it through meetings, agendas, strategic papers, policy adoptions and eventually, specific measures. Now, in late 2022, data showed that 2015 was the warmest year ever recorded on Earth, with fifteen of the sixteen warmest years on record occurring since 2001. The 2015 temperature record continues a long-term warming trend, according to NASA and the National Oceanic and Atmospheric Administration (NOAA), and most of it, occurring in the past 35 years, has largely been driven by increased carbon dioxide and other greenhouse gases that humans have emitted into the atmosphere (*EarthObservatory, 2016)*. In January 2022 the World Meteorological Organization reported that 2021 was among the seven warmest years on record, one of the long-term climate change trends that were expected to continue as a result of record levels of heat-trapping greenhouse gases in the atmosphere *(UN News, 2022)*. Then there was the COVID-19 pandemic that showed societies how fragile our sophisticated socio-economic system was at a price so high, that shouldn't have been paid in the first place. The crisis has shown to countries that dependence on essential production processes outside their boundaries could be a fatal risk. The tension about the development, production and timely supply of medical accessories, equipment, and later vaccines has displayed a reality where some outsourced economic activities in the EU and the US could not be internalized fast enough. As we have turned our hope and efforts to the development of new therapies and vaccines, people have realised the importance of a system that supports research and innovation *(Marinelli, Fernández, Pontikakis, 2021)*. And then in February 2022 Russia, the world's largest oil exporter to global markets and main supplier of natural gas to the European Union, launched a full-scale military invasion into Ukraine, driving oil and gas prices to their highest levels in nearly a decade.

The conflict shook the markets and geopolitics of energy and forced many countries to reconsider their energy supplies - again, but this time probably for real, since this wasn't the first time that Russian military aggression posed a threat to the region's energy security (after conflicts with Georgia in 2008, and Crimea in 2014) *(Tollefson, 2022)*. The COVID-19 pandemic and the conflict in Ukraine are some of those less expected crisis that have their negative effects on overall wellbeing, and they certainly will not be the last ones. But there are global trends - societal challenges that are significant threats to life as we know it, ones that require taking responsibilities at the individual and collective level as soon as possible. Another statement in *the Brundtland Report* was that future economic growth must be less energy intensive than growth in the past, with energy efficiency policies the cutting edge of national energy strategies for sustainable development. It urged for appliances to be redesigned 'to deliver the same amounts of energy-services with only two-thirds or even one-half of the primary energy inputs needed to run traditional equipment'. The highest priority should be put, it said, on research and development on environmentally sound and ecologically viable alternatives, which required a program of coordinated research, development, and demonstration projects (*Brundtland, 1987*). In 2015 the United Nations adopted seventeen Sustainable Development Goals (SDGs) as a universal call to action to end poverty and protect the planet, stating that 'the creativity, knowhow, technology and financial resources from all of society is necessary to achieve the SDGs in every context' (UNDP, 2022). Building on them, global organizations and countries are giving increasing attention to different aspects of sustainability. Also in 2015, the European Commission presented the idea of an Energy Union based on three long-established objectives of Union's energy policy: security of supply, sustainability and competitiveness. One of the five mutually supportive dimensions in this plan is about research, innovation and competitiveness. In 2019 the European Commission adopted the European Green Deal - an ambitious strategy for the next decade, a new long-term vision for development of the Union, where growth, fair environmental transition, and resource-efficient and low-carbon economy are the key highlights. It consists of a whole set of activities, practices and business models, interconnected and hierarchically structured, that will require rethinking of the current technologies, development of new ones relevant to the sustainability needs, innovation and the creation of new products and services *(Ivanova, 2021)*. The purpose of this article is to analyse Bulgaria's commitments and readiness to achieve the goals of the European Energy Union and the European Green Deal in the field of technology and innovation. The working hypothesis being tested states that technology and innovation as a part of the Bulgarian economy underperforms compared to the European Union and that there needs to be a continued, sustained effort at political and administrative levels to deliver on the commitments and desired results. The research is based on a descriptive analysis of secondary data, legal documents and reports.

2. INNOVATION AND TECHNOLOGY AS PART OF THE SUSTAINABLE ENERGY DEVELOPMENT OF BULGARIA UNTIL 2030

The European Commission adopted a Framework Strategy for a Sustainable Energy Union with a forward-looking climate change policy in order to provide consumers in the European Union with a secure, sustainable, competitive and affordable energy supply. As a result of this strategy, the Energy Union was created, which is mainly related to the transformation of Europe's energy system and the introduction of a comprehensive and legally binding framework to achieve the goals of the Paris Agreement. Five dimensions are closely intertwined in the European Energy Union to contribute to achieving greater energy security, sustainability and competitiveness:

1) Energy security, solidarity and trust.
2) An integrated European energy market.
3) Energy efficiency.

4) Decarbonization of the economy.
5) Research, innovation and competitiveness.

In fulfillment of the commitments to achieve the goals of the European energy policy to create an Energy Union, a Strategy for sustainable energy development of the Republic of Bulgaria until 2030, with a horizon until 2050 (Strategy 2030) was developed. It reflects Bulgaria's vision for the development of its energy sector until 2030, with a horizon until 2050, consistent with the current European energy policy framework and global trends in the development of new energy technologies *(Ministry of Energy of the Republic of Bulgaria, 2021)*. The Strategy 2030 states that it lays down common European policies and goals for the development of energy and for limiting climate change, reflects national specificities in the field of energy resource, the production, transmission and distribution of energy. There are main strategic decisions defined, aimed at achieving national goals and guaranteeing Bulgarian interests. The strategy says it reflects the trends, measures and policies in the field of energy security, energy efficiency, the liberalization of the electricity and gas market and their integration into the common European energy market, the development and implementation of new energy technologies. These policies are also reflected in the Integrated Energy and Climate Plan of the Republic of Bulgaria 2021 - 2030, with a horizon up to 2050, which was prepared in implementation of Regulation (EU) 2018/1999 on the management of the Energy Union and of climate action. Strategy 2030 sets the following main priorities:
1) Guaranteeing energy security and sustainable energy development.
2) Development of an integrated and competitive energy market and consumer protection by guaranteeing transparent, competitive and non-discriminatory conditions for the use of energy services.
3) Increasing energy efficiency in the processes from production to final energy consumption.
4) Sustainable energy development for clean energy and decarbonization of the economy.
5) Implementation of innovative technologies for sustainable energy development.

The document consists of several chapters, dedicated to topics such as energy security and sustainable energy development, development of an integrated and competitive energy market, energy efficiency, clean energy, energy forecasts. One of the smallest chapters informs about the policies and goals that Bulgaria sets for the implementation of innovative technologies in 'a real, working environment'. These are:
- introduction of market-oriented innovative services that respond to the changing needs and capabilities of users and increase the flexibility of the energy system;
- promoting the construction of energy storage systems, which will complement the traditional way of energy storage;
- storage of renewable energy in the gas transmission network through "Power-to-gas" technology;
- promoting the development of distribution networks, through the introduction of smart networks, which should be built in a way that promotes decentralized energy production and energy efficiency;
- promoting the use of installations prepared for intelligent management and digital solutions in the building stock to reduce energy consumption;
- increasing the number of buildings with close to zero energy consumption, by using new technologies and materials for renovation of buildings and glazed surfaces;
- implementation of new highly efficient energy technologies leading to a significant reduction in energy costs;
- use of hydrogen for the production of thermal and/or electrical energy;
- development of electromobility and hydrogen technologies in the transport sector.

The chapter continues with statements such as that state's efforts will be directed to the implementation of new energy-saving technologies, which make a significant contribution to lowering carbon emissions in the atmosphere, reducing the greenhouse effect and overheating of buildings, at the same time lowering costs of end customers for the heat and electricity they consume. Two paragraphs are dedicated to the importance of hydrogen, and the last one to the 'Power-to-gas' concept. After the Ministry of Energy proposed the draft for Strategy 2030 for public discussion, all of the published opinions in the public platform Strategy.bg are highly critical. Critics say that the Strategy 2030 is built mostly around identifying the problems, with highly aspirational nature of activities, but lacking specific measures or sources of financing. There is no Research priority, part of the fifth dimension in the European Energy Union, which signals the unwillingness of government to strengthen cooperation between science and business in the energy field. There are no cost-benefit analyses of activities, impact assessment, specific time frames, the ways and level of involvement of the other stakeholders.

3. STATE OF TECHNOLOGY AND INNOVATION IN BULGARIA
The European Green Deal generates new challenges for all member states of European Union, technologically and economically, socially, politically, and legislatively. From a technological perspective, the transfer to a green economy involves major changes in areas such as energy, waste management, transportation, agriculture, construction, and many other fields to address global climate change *(European Commission, 2022a)*.

3.1. Problematic areas in the Bulgarian eco-innovation and digital economy
Technology and innovation have enormous potential for contributing to the SDGs and the goals of the European Green Deal. Digitalization as part of the process supports the development of a highly interconnected system and networking process, the convergence and interplay of many fields, such as computer science, engineering, informatics, mathematics, manufacturing, etc. Four universal trends characterize innovation in the digital age *(OECD, 2019)*:
1) Data is becoming a key input for innovation.
2) Innovation activities increasingly focus on the development of services enabled by digital technologies.
3) Innovation cycles are accelerating, with virtual simulation, 3D printing and other digital technologies providing opportunities for more experimentation and versioning.
4) Innovation is becoming more collaborative, given the growing complexity of and interdisciplinary needs for digital innovation.

The Eco-Innovation Index, developed by the Eco-Innovation Observatory, is a tool to assess the performance of EU Member States and complements other measurement approaches of innovativeness of countries such as the EU Innovation Scoreboard. The different aspects of eco-innovation are grouped into five thematic areas using sixteen indicators *(EIO, 2020)*:
1) Eco-innovation inputs comprising investments (financial or human resources) which aim at triggering eco-innovation activities.
2) Eco-innovation activities, illustrating to what extent companies in a specific country are active in eco-innovation.
3) Eco-innovation outputs, quantifying the outputs of eco-innovation activities in terms of patents, academic literature and media contributions.
4) Resource efficiency outcomes, putting eco-innovation performance in the context of a country's resource (material, energy, water) efficiency and GHG emission intensity.
5) Socio-economic outcomes, illustrating to what extent eco-innovation performance generates positive outcomes for social aspects (employment) and economic aspects.

In the 2021 Eco-Innovation Index, Luxembourg leads the ranking of all EU countries, with an aggregated score of 171. Finland follows with a score of 157, Austria and Denmark are tied at 150. The 'eco-innovation leaders' grouping is completed by Sweden, Germany, France, Spain and the Netherlands. Ten Member States obtained scores around the EU average of 100 and were therefore labelled as 'average eco-innovation performers'. The aggregated eco-innovation scores in this group range from 124 - Italy, to 90 - Latvia. The last group is composed of nine countries that are catching-up with eco-innovation and their aggregated scores range from 88 for Lithuania to 50 for Bulgaria (Figure 1).
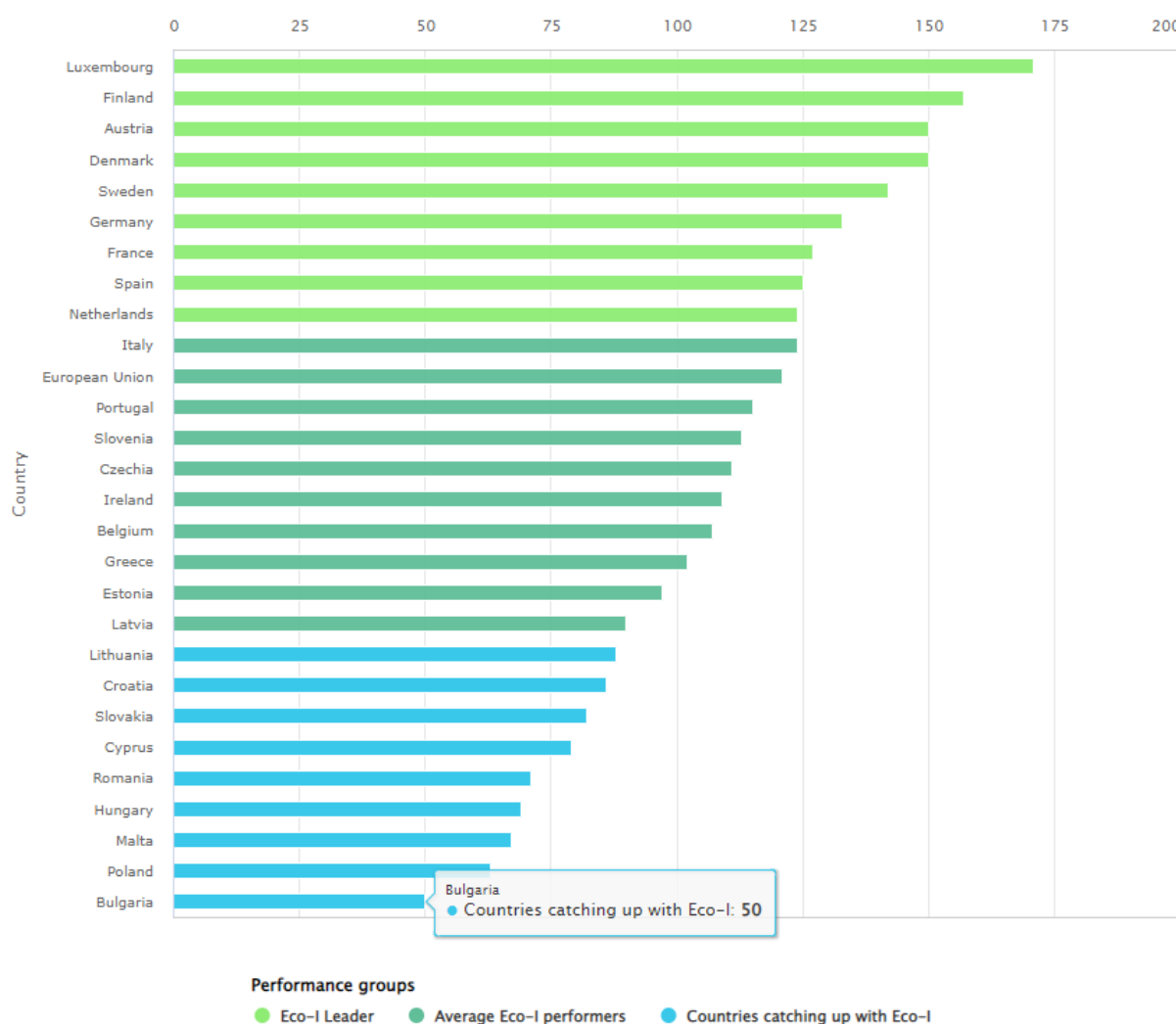
Figure 1: General ranking - Eco-innovation index of the EU Members States, 2021
(Source: https://ec.europa.eu/environment/ecoap/indicators/index_en)

Category 4 Resource efficiency outcomes of the Eco-Innovation Index includes the material, water and energy productivity in each country, as well as the GHG emissions intensity. For 2021 the indicator 'Energy productivity' puts Bulgaria in the last place, far behind the leaders Denmark and Ireland (Figure 2). This performance according to the Eco-Innovation Observatory is due to structural issues with the Bulgarian economy, the remaining electricity generation from coal and the few resource efficiency actions. The overall conclusion is that energy efficiency actions have become relatively mainstream, but obviously not enough to shift the place of Bulgaria in the EU under this component (EIO, 2019).
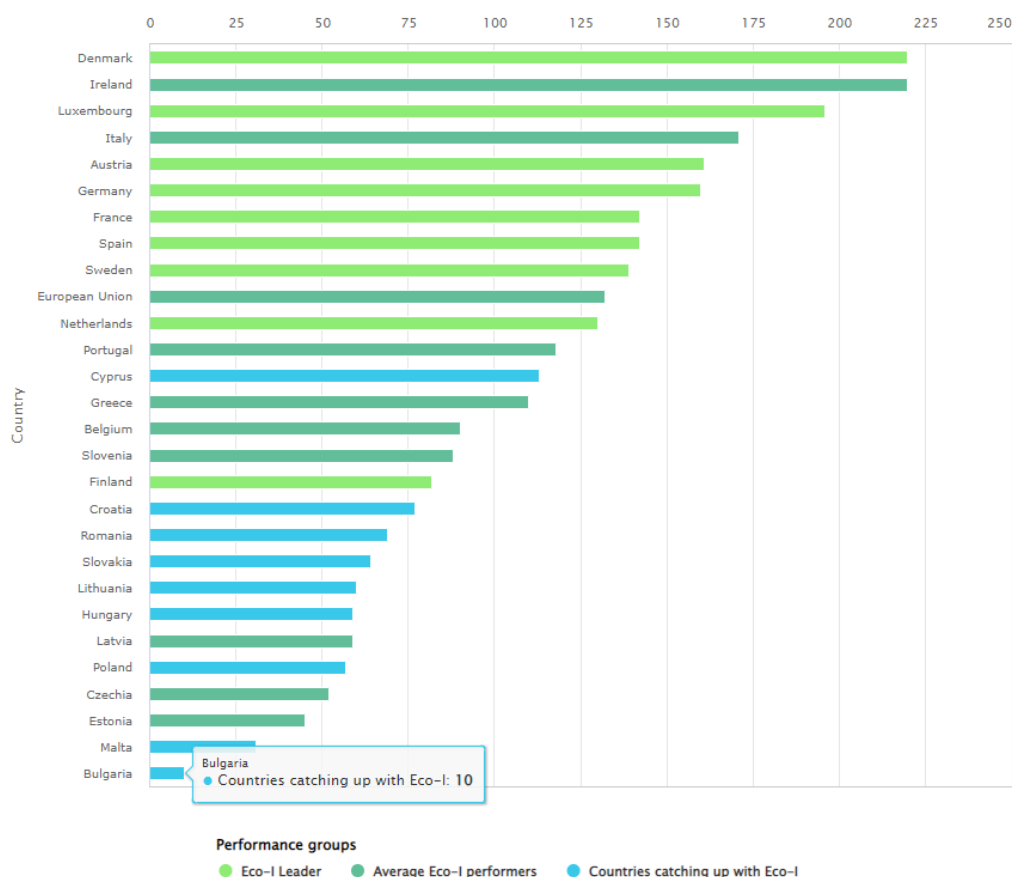
Figure 2: Energy productivity - Eco-innovation index of the EU Members States, 2021
(Source: https://ec.europa.eu/environment/ecoap/indicators/index_en)

The Eropean Union has put on the table significant resources to support the digital transformation - EUR 127 billion are dedicated to digital related reforms and investments in the national Recovery and Resilience Plans after the COVID-19 pandemic. The European Commission has been monitoring Member States' digital progress through the Digital Economy and Society Index (DESI) reports since 2014. In 2022 Bulgaria ranks 26th of the 27 EU Member States in the European Commission Digital Economy and Society Index (DESI), just above Romania (Figure 3). Bulgaria's DESI score grew at an annual average of 9% over the past five years, but this growth rate is not sufficient for the country to catch up with the other EU Member States *(European Commission, 2022b)*.
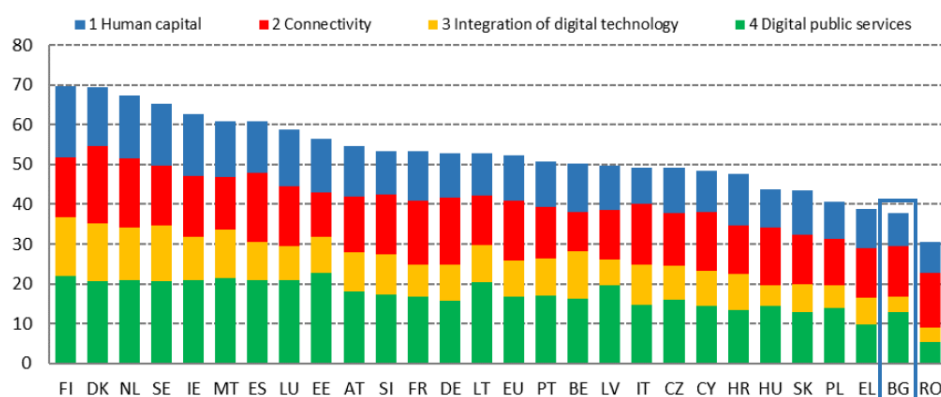
Figure 3: Digital Economy and Society Index (DESI) 2022 ranking
(Source: European Commission, 2022a)

The DESI index states that Bulgaria is facing many challenges regarding the digitalization of its public services, as it underperforms in most indicators - with the exception of open data, which is within the EU average. Only 34% of internet users in the country interact with the government online, compared to 65% in the EU, and the supply of digital public services for citizens have a 59 score versus an EU average of 75. Despite Bulgaria's National Registry reform, those scores need to improve significantly to enable Bulgaria to contribute to the 2030 Digital Decade target of all key public services offered fully online. A conclusion of 2022 DESI ranking is that to overcome the deficiencies in Bulgaria's digital transformation and to start catching up with the other EU Member States, there needs to be a continued, sustained effort at political and administrative level that builds on the country's strengths to deliver on the reforms and investments in all four dimensions. The recent political instability may have significantly affected attempts in this area.

3.2. Positive trends in the Bulgarian high-tech environment
The COVID-19 pandemic has slowed outward labor migration and at the same time forced many Bulgarians to return to the country for safety reasons. As restrictions on travel and work abroad are gradually lifted, and as Bulgaria has an open economy that has historically demonstrated periods of stable growth, an important domestic issue must be addressed: what is the best way to rebuild the economy given the change in current patterns of world trade. For Bulgaria, innovation can be the key to successful change. In the first quarter of 2020, record amounts of venture capital poured into European companies were registered. In February 2020, OTB Ventures, a leading venture capital fund specializing in investments in technology companies in Central and Eastern European (CEE) countries, announced the launch of its early growth technology fund with EUR 92.4 million in commitments. This fund is the largest venture capital fund in Central and Eastern Europe (CEE) and is backed by international institutional investors, including the European Investment Fund (EIF). In this context, the technology environment in CEE is perhaps reaching its golden age, with its abundant engineering talent and lower labor and living costs compared to Western Europe and the US, making the region attractive to both company founders and investors. (Pisoň, 2021). This also affected the Bulgarian hi-tech companies. In the month of March 2022, the Bulgarian technology environment marked a historic achievement when the financial platform Payhawk announced 100 million US dollars in new funding and thus became the first Bulgarian "unicorn" - a private start-up company worth more than 1 billion US dollars (Gillet, 2022). With the $115 million raised in November 2021, the Bulgarian fintech company also registered the most funds raised for a B2B company from Eastern Europe, surpassing the 2018 peak achievement of the Romanian giant UiPath. Payhawk's headquarters are in London, but three quarters of its staff work in Bulgaria. The company plans to add 60 additional senior software engineers to its team in Sofia, as well as open offices in Amsterdam and Paris in March and in New York in September 2022, thus increasing its headcount that year from 100 to more than 300. But when it comes to Bulgarian technology, Payhawk is not the only Bulgarian technology company with similar successes, but part of a larger trend observed in recent years. Hyperscience is a technology company founded in 2014 in Bulgaria, which develops corporate software based on artificial intelligence, designed to automate work processes in the office. In 2022, the company has offices in Sofia, London and New York, has nearly 400 employees worldwide, announced the raising of $100 million, bringing its total funding to $290 million (Hyperscience.com, 2022). Gtmhub is a Bulgarian-American company with offices in Sofia, Denver, London, Paris and Berlin. The company started in 2015 with the idea of an analytics platform through which organizations could track their most important metrics to improve decision-making. In December 2021, Gtmhub raised $120 million in funding, the largest round in its specialized software niche at that time (Gtmhub, 2022).

Paynetics is a payment service provider based in Sofia, offering various solutions for merchants, including a point-of-sale (POS) application for smartphones. The company raised a total of €2.5 million in funding in March 2020 (Crunchbase.com, 2022). Capitalizing on the global e-mobility trend, Bulgarian startup Ampeco aims to become a global platform for providing electric vehicle charging, while electric bike company ElJoy, built by enthusiasts and entrepreneurs with a passion for green culture and technology, are close to becoming the leading producer of this product in Europe (Gillet, 2020). Fourteen of the 38 companies presented in Table 1 are 'unicorns' with a market value of over a billion US dollars. The region is home to 20 countries whose best-funded tech startup has raised over $100 million in equity funding (including Bulgaria). Given the dynamic growth of the technological sector in Bulgaria, the country has an important role in the region of Southeast Europe. In May 2022, the Bulgarian Innovation Center (BIH) provided training for a new group of potential 'unicorns, as four of the five companies receiving expert advice, know-how and mentorship from Silicon Valley entrepreneurs and investors to support their global expansion are Bulgarian - Humans in the Loop, StorPool, Augment and Rush (TheRecursive.com, 2022).

Rank	Company	Country	Total Equity Funding ($M)
1	OneWeb	Great Britain	$5 219
2	Northvolt	Sweden	$3 996
3	Trendyol	Turkey	$1 538
4	Celonis	Germany	$1 368
5	Bolt	Estonia	$1 206
6	Glovo	Spain	$1 162
7	Mollie	Netherlands	$934
8	Wolt	Finland	$821
9	ManoMano	France	$709
10	Vinted	Lithuania	$562
…			
25	Gtmhub	**BULGARIA**	**$40**
…			
38	FRVR	Malta	$5,6

Table 1: The most well-funded tech startups in Europe (as of August 2021, by country) (Source: Cbinsights.com, 2021)

In February 2022, Endeavor Insight published a survey on the Sofia tech sector with the aim of providing insight into the current state of the sector, assessing its strengths and weaknesses, and enabling decision-makers to understand and support local tech entrepreneurship (Endeavor Insight, 2022). The report recalls that before the changes of 1989, the electronics and telecommunications sectors represented 25% of industrial production in Bulgaria, employing about 130,000 people, including 8,000 highly qualified engineers. With the end of the communist regime came the collapse of large state-owned enterprises, research and development centers were closed and specialists were directed to the private sector. By 2000, Bulgaria managed to gradually build a good reputation as a software producer, often in niche areas, and was the 25th fastest growing ICT market in the world from 2003 to 2007. Entry into the European Union provided access to financial programs and tools and laid the foundation for an ever-evolving ecosystem. In 2020, computer programming, consulting and information services represented 5.6% of the Bulgarian GDP, which was three times more than ten years ago; the software sector employed more than 34,300 people with an average salary more than three times the national average. The sector's revenue grew by 18.4% in 2019 to 2 billion euros, more than 80 percent of which was directed to exports, mainly to the EU and the US.

The number of local venture capital funds and private equity funds as of 2022, according to the report, is 17, most of them created by various European investment funds and instruments. The technology sector currently represents about 4% of Bulgaria's GDP, and before the pandemic it's been growing at an average annual rate of 10%.

4. CONCLUSION

The transition to a sustainable, energy efficient society is based on the UN's Sustainable Development Goals, integrated in the European Union into initiatives such as the European Energy Plan and the European Green Deal. The new EU's programming period started at a significant time in history – facing ongoing challenges such as climate change, combined with less expected crises such as COVID-19 and the war in Ukraine. The European Commission is aware that 'digital technologies, as advanced as they may be, are just a tool. They cannot solve all of our problems. Yet they are making things possible which were unthinkable a generation ago' *(European Commission, 2020)*. In order to deal with the fast-changing reality, especially in the energy sector, and to align with the SDGs and EU's goals, the Bulgarian government developed its corresponding documents, such as the Strategy for sustainable energy development of the Republic of Bulgaria until 2030, with a horizon until 2050. While Strategy 2030 pretends to be formally aligned to EU's priorities, the document simply identifies some of the problems with few specific measures in it. As to the technology and innovation sector, it shows that public authorities neglect cooperation between science and business in the energy field, nevermind the research field. The initial hypothesis of the research confirms and highlights the need for a more clear and definitive position by the Bulgarian government towards R&D and innovation in the energy sector. Countries with low investments in eco-innovative research and innovative start-ups tend to also perform less well in reaching the SDGs, as this relationship between poor performance in inputs and poor performance in outputs and outcomes is especially evident in the group of countries classified as catching up in eco-innovation in the Eco-Innovation Index. Still, the presented data from the Endeavor Insight report shows that Bulgaria has a chance to become a leader in Central and Eastern Europe and a model for Western Balkan countries in the high-tech sector because, compared to many of its neighbors in CEE, Bulgaria has a more developed environment in terms of supporting companies in the growth and expansion stages *(Endeavor Insight, 2022)*. If tech startups continue to make the same progress, this trend will support not only the local economy, but also of the neighboring countries, and thus will increase the interest of foreign investors in the region as a whole.

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USAGE OF ELECTRONIC PUBLIC SERVICES IN BULGARIA

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ABSTRACT
The digitalization of services provided by public institutions can substantially reduce the costs of citizens' interactions with these institutions, like travel and waiting times. It can also increase the efficiency of providing these services. Despite the benefits, Bulgaria still lags behind most European Union countries regarding the use of e-government services. Only 36% of the Bulgarian internet users access e-government services, compared to an EU average of 64%. While the supply side of the public e-services is regularly the focus of general discussions, little is known about the demand for e-services in Bulgaria. This paper contributes to understanding the usage patterns of e-services provided by governmental, healthcare, and educational institutions. We link the propensity of using the three different types of e-services to the socio-demographic and economic characteristics of the respondents within a multilevel logistic regression model using data from a sample of Bulgarian internet users. The results show that persons with low educational attainment, low self-reported digital technology skills, and lack of experience with commercial electronic services are less likely to use any of the three types of public e-services. Respondents living in rural areas or small towns were also less likely to access public e-services. Furthermore, the model reveals a regional variation that can help focus information campaigns about e-services.
Keywords: *digitalization, electronic education, electronic healthcare, e-government, public services*

1. INTRODUCTION
The improvement of information and communication technologies in the past decades has profoundly changed almost every aspect of daily life, including commerce, social interactions, and how citizens interact with their governments. Data Lakes provide a modern approach to persist data with heterogenous structure for different types of analysis. It offers centralized repository that allows to store all structured and unstructured data at any scale. Automation flows include cloud workloads as well as Robotic process automation (RPA) flows that enables engineers and non-coders alike to automate processes and tasks across desktop and web applications. (Mateev, 2022) The online delivery of services through the web or mobile applications enabled governments to cut the costs of service provision by reducing the need for costly face-to-face interactions. Apart from the more efficient use of taxpayers' money, the online delivery of services can lower the cost of citizens' interaction with the administration by removing their need to travel to a service desk and their dependence on fixed opening hours (Gilbert, Balestrini & Littleboy 2004). Despite these benefits, the adoption rate of e-government services has fallen behind expectations (Carter, Weerakkody & Phillips *et al.* 2016). Bulgaria is currently lagging behind most European Union (EU) countries with one of the lowest shares of e-government users (34%) compared to an average of 65% for the whole union (European Commission 2022).

The low adoption rate is partly due to the comparatively low population uptake of broadband internet connections. In 2022 only 63% of households in Bulgaria had a fixed or mobile broadband connection, compared to an EU average of 78%. The lack of computer equipment or reliable internet connection in parts of the country partially explains this low adoption rate. Another reason is that the ability to use information and communication technologies (ICT) is spread unevenly between socio-demographic groups in most countries, creating a skill-based digital divide regarding access to online services, including the ones provided by governments (Bélanger & Carter 2009). Further factors impacting the adoption of e-government are varying levels of privacy concerns and citizens' trust in government communication systems' integrity, trust in internet technologies and trust in the government in general (Alzahrani, Al-Karaghouli & Weerakkody 2017; Distel 2020; Mensah & Mi 2017). This paper contributes to the e-government adoption research by analyzing three different types of government services in Bulgaria: administrative services like online tax or fee payments, education-related services provided by schools or universities, and healthcare-related services like online scheduling appointments with the family doctor and access to the personal medical history. We use a sample of internet users collected in June and August 2021 to compare the socio-demographic and economic characteristics of adopters and non-adopters of the three types of services. Within a logistic regression model framework, we find that self-assessed digital skills and educational attainment are strongly associated with the propensity to adopt e-government services in all three areas. Gender differences are present only in education-related services, with women having a higher probability of using these. We observe different adoption rates between income groups for administrative and education-related services, but not in the case of healthcare-related services.

2. BACKGROUND

A lot of the research approaches the problem of the varying degrees of adoption of e-government services by applying the technology acceptance model (Davis 1989). According to that model, a person would accept a new technology if he or she believes that the technology would enhance her performance (perceived usefulness). The performance gain is weighed against the effort the person expects to expend to use the technology (perceived ease of use). Empirical research has consistently found a strong link between the perceived usefulness and ease of use and the intention to use e-government services (Horst, Kuttschreuter & Gutteling 2007; Camilleri 2019; Mensah, Zeng & Luo 2020). Another insight from this research shows that both factors tend to vary between socio-demographic groups as digital skills and attitudes towards ICT are distributed unevenly in the population (Bélanger & Carter 2009). Numerous studies report that younger persons are more prone to interact with online services than the elderly. This finding appears consistently in different contexts: the USA: Bélanger & Carter (2009), Scottland: Camilleri (2019). Inkinen, Merisalo & Makkonen (2018) find age closely associated with e-government usage of various services ranging from electronic tax forms to social insurance e-notices. A notable exception is Taipale (2013), who found no age differences in e-government usage behavior and explained the lack of an effect with reduced availability of offline services in Finland that make face-to-face interactions costlier for the citizens. The results in the extant literature disagree on the effect of gender on e-government usage. Bélanger & Carter (2009), Moreno, Molina & Figueroa *et al.* (2013), Inkinen, Merisalo & Makkonen (2018), Camilleri (2019), and Rodriguez-Hevía, Navío-Marco & Ruiz-Gómez (2020) find no significant differences between the adoption behavior of men and women. In a different context (Dubai), Sarabdeen & Rodrigues (2010) discovered that men were more likely to use e-government services. A person's educational attainment may be an important determinant of his or her ability to use e-government services.

Highly educated persons tend to be more experienced with digital technologies, which puts them in a better position to interact with complex services. Bélanger & Carter (2009) and Mensah, Zeng & Luo (2020) find a strong association between education, perceived ease of use, and perceived usefulness. A study of e-government adoption in European countries (Rodriguez-Hevía, Navío-Marco & Ruiz-Gómez 2020) reports a higher likelihood of being an e-government adopter for highly educated persons. In the context of Finland, Inkinen, Merisalo & Makkonen (2018) report that the connections between education and usage are not uniform and depend on the particular type of e-service. High equipment costs in the early days of the internet created a divide between persons who could afford a computer and an internet connection and those who were unable. Although the access divide has been diminishing in the past decades (Martin & Robinson 2014), e-government adoption research reports that income is still a significant predictor of e-government use, with higher income associated with a higher rate of e-government adoption (Bélanger & Carter 2009). As in the case of gender and age, the association between income and e-government use may be country-dependent, as other authors find no relation between income and adoption (Colesca & Dobrica 2008) (Romania) or a negative association (Taipale 2013) (Finland). The effect of income on service adoption may also differ depending on the particular type of service. Inkinen, Merisalo & Makkonen (2018) (Finland) found that higher average income was associated with a higher will to prioritize e-services over face-to-face interactions, but the effect differed by service type. Higher household income was associated with a lower tendency to use e-employment services targeted at the unemployed but with a higher probability of accessing e-tax services. The research has reached different conclusions regarding the people's experience with the internet in general and with commercial services like online shopping as a predictor for e-government adoption. Bélanger & Carter (2009) that the frequency of internet use and a prior experience with online shopping are not significant predictors for e-government adoption. Taipale (2013) report an interaction effect between experience with the internet and gender. Women spending more time online were more likely to take up e-government services, but this relationship was not present for men. Less prominent in the e-government research are differences between ethnic or cultural groups, rural and urban areas. Schwester (2010) reports different e-government adoption rates and different maturity levels of e-government services depending on the ethnic composition in twenty cities in the USA. Seo & Bernsen (2016) found differences in attitudes towards e-government adoption between urban and rural residents in the Netherlands. Cultural differences have been found to relate to e-government diffusion in cross-country comparative research (Zhao, Shen & Collier 2014) and on an individual level (Rufín, Bélanger & Molina *et al.* 2014).

3. DATA AND METHOD

The data for this analysis was obtained between June and August 2021. Trained interviewers polled Bulgarian internet users in the survey in tablet-assisted face-to-face interviews. The minimum age for participation was 15 years. The main questionnaire contained questions about the use of e-government services in the past twelve months. (n = 1039) participants had not accessed any e-government service in that period, and (n = 385) had used at least one service. The participants in the non-users sample were selected at a higher rate in the large cities in Bulgaria. The e-government services fall into three broad categories: administrative, education-related, and healthcare-related services. The administrative services include electronic renewal of identity documents, driver's licenses, tax declarations, tax and fines payments, electronic receipts of payment from governmental entities like pensions and social security payments, and access to one's social security status. Searching for information about employment opportunities or social security assistance in online government sources is also included in this category.

Variable	Value	Nonusers	Users	Total
City	City	215	728	943
	Rural	91	142	233
	Small town	79	169	248
Education	Primary	23	57	80
	Secondary	235	465	700
	Higher	127	517	644
Gender	Male	163	374	537
	Female	222	665	887
Income	<650	19	59	78
	650-1250	34	359	393
	1251-1850	46	193	239
	1850-2450	37	102	139
	2451-3000	37	54	91
	>3000	27	30	57
	Missing	185	242	427
Labor status	Employed	275	816	1,091
	Student	21	138	159
	Retired	67	47	114
	Unemployed	22	38	60
Online shopping	Never	225	166	391
	Rarely	143	623	766
	Often	17	250	267
Technical skills	Low	102	54	156
	Middle	152	310	462
	High	131	675	806

Table 1: Distribution of socio-demographic variables, ICT skills, and online shopping by sample
(Source: own calculations)

The healthcare-related services refer to online access to medical information, personal medical status, and a service that allows citizens to schedule appointments with their family doctor and to consult online with their doctors. The education-related services include access to school or university online courses or other materials, electronic access of grades, online enrollment in schools or universities, online information about learning schedules, and online payment of enrollment fees. The respondents also gave information about their gender (male, female), occupational status (student, employed, unemployed, or retired), educational attainment (primary, secondary, or higher), type of residence (rural, small town, or city), and monthly income in BGN, measured in six groups. Among the respondents who had used at least one type of service 65.54% had used at least one of the administrative services, 42.06%, and at least one of the education-related and 42.06% at least one of the healthcare-related services. 12.42% of the users had accessed all three types of services in the past year. The usage probability for each service type is modeled in a logistic regression with main effects for the socio-demographic variables, the level of ICT skills, and the frequency of online shopping. Each equation also includes normally distributed random effects for the respondent's administrative region of residence (28 regions).

The region-level intercepts account for e-government adoption effects not captured by the fixed effects in the model, such as ethnic composition, cultural differences, and different levels of support for services delivered by local providers like municipal authorities, universities, and schools. Furthermore, the regional effects account for the sampling design that emphasized large cities in for e-government non-users. All three equations are estimated simultaneously, and the correlation between the region-level effects is estimated within the model. The model uses weakly informative normal priors for the fixed effects centered at zero with a standard deviation equal to 2 and exponential distribution priors with $\lambda = 1$. For the correlations between the random effects, the model uses a LKJ(1) prior that expects correlations close to zero. A robustness analysis showed that the main results of the analysis do not depend substantially on the choice of priors. The model was estimated using a NUTS sampler with four chains with 6000 iterations.

4. RESULTS

Table 2 presents the posterior means and standard errors of the fixed effects of the logistic regression models. The coefficients with a 95% central credible interval not containing zero are shown in boldface. Positive coefficients imply a greater probability of using a service type. Contrary to some previous findings (Sarabdeen & Rodrigues 2010), the model shows no evidence of a greater propensity of men to use e-government services than women for administrative and healthcare-related services, and women were more likely to use education-related services than men. Although we expected respondents in rural areas to be less likely to use e-government services due to poorer internet coverage and less experience with digital technologies, the model does not indicate a difference between rural dwellers and residents of big cities. However, residents of small towns tended to be less likely to use administrative and healthcare-related services than residents of big cities. The model likely underestimates this effect because the non-users sample emphasized the large cities in Bulgaria. The association between income and the propensity to use varies for the three types of services. For the administrative services, the highest and the lowest income groups have similar coefficients that are lower than the middle-income groups. Regarding education-related services, the highest income category has the lowest usage probability. At the same time, there appears to be no substantial variation between income groups in usage rates in healthcare-related services. As the model does not directly include the respondents' age, the occupational status variables capture age differences between the respondents, with students generally being the youngest and retired persons: the oldest. Students were more likely to use electronic educational services than employed persons, as most education-related services specifically target younger persons. Another factor was the switch to remote learning methods during the COVID-19 pandemic. Students were less likely to engage with electronic administrative services, as most of these are only relevant for economically active persons.

Table following on the next page

		Administration		Education		Healthcare	
Variable	Level	Mean	StdDev	Mean	StdDev	Mean	StdDev
Gender (ref: male)	Female	-0.19	0.13	**0.47**	0.16	0.00	0.14
Residence type (ref: city)	Rural	-0.08	0.19	-0.13	0.24	0.17	0.20
	Small town	**-0.45**	0.18	-0.13	0.22	**-0.65**	0.20
Income (ref: <650)	650-1250	**1.02**	0.32	-0.28	0.35	0.04	0.32
	1251-1850	**1.07**	0.34	-0.46	0.37	-0.05	0.35
	1850-2450	**0.94**	0.37	-0.67	0.42	0.75	0.39
	2451-3000	0.32	0.39	-0.48	0.44	0.02	0.41
	>3000	-0.20	0.43	**-1.37**	0.54	-0.49	0.48
	Missing	-0.35	0.35	**-0.82**	0.40	-0.67	0.36
Labor status (ref: employed)	Student	**-0.73**	0.32	**4.16**	0.40	-0.29	0.36
	Retired	**0.78**	0.31	**-1.42**	0.57	0.33	0.34
	Unemployed	-0.20	0.36	-0.04	0.41	-0.13	0.38
Education (ref: higher)	Middle	**0.83**	0.40	0.23	0.43	0.45	0.41
	High	**1.17**	0.42	**1.19**	0.46	**0.97**	0.43
ICT skills (ref: low)	Middle	**0.51**	0.24	**0.88**	0.43	**1.11**	0.29
	High	**1.08**	0.25	**1.49**	0.43	**1.02**	0.30
Online shopping (ref: never)	Rarely	**1.03**	0.16	**1.01**	0.23	**0.69**	0.19
	Often	**1.38**	0.22	**1.39**	0.27	**0.51**	0.23

Table 2: Fixed effects of the logistic regression model: posterior means and standard deviations. Coefficients with 95% credible interval that do not including zero are bolded (Source: own calculations)

The same applies to the low predicted probability of retired persons using education-related services. An unexpected result is the predicted greater probability of retired persons using administrative services compared to the employed. This is a consequence of the survey design that did not collect income data from retired respondents and students. Refitting the model without the income variable (not shown) reveals a lower propensity of retired persons to interact with administrative services.

Term	Estimate	l-95% CI	u-95% CI
StdDev: Administration	0.62	0.37	0.96
StdDev: Education	0.80	0.49	1.20
StdDev: Healthcare	1.31	0.93	1.83
Correlation: Administration, Education	0.16	-0.38	0.62
Correlation: Administration, Healthcare	0.37	-0.08	0.72
Correlation: Education, Healthcare	0.38	-0.06	0.72

Table 3: Summary of region-level random effects: posterior means and 95% credible intervals (CI) (Source: own calculations)
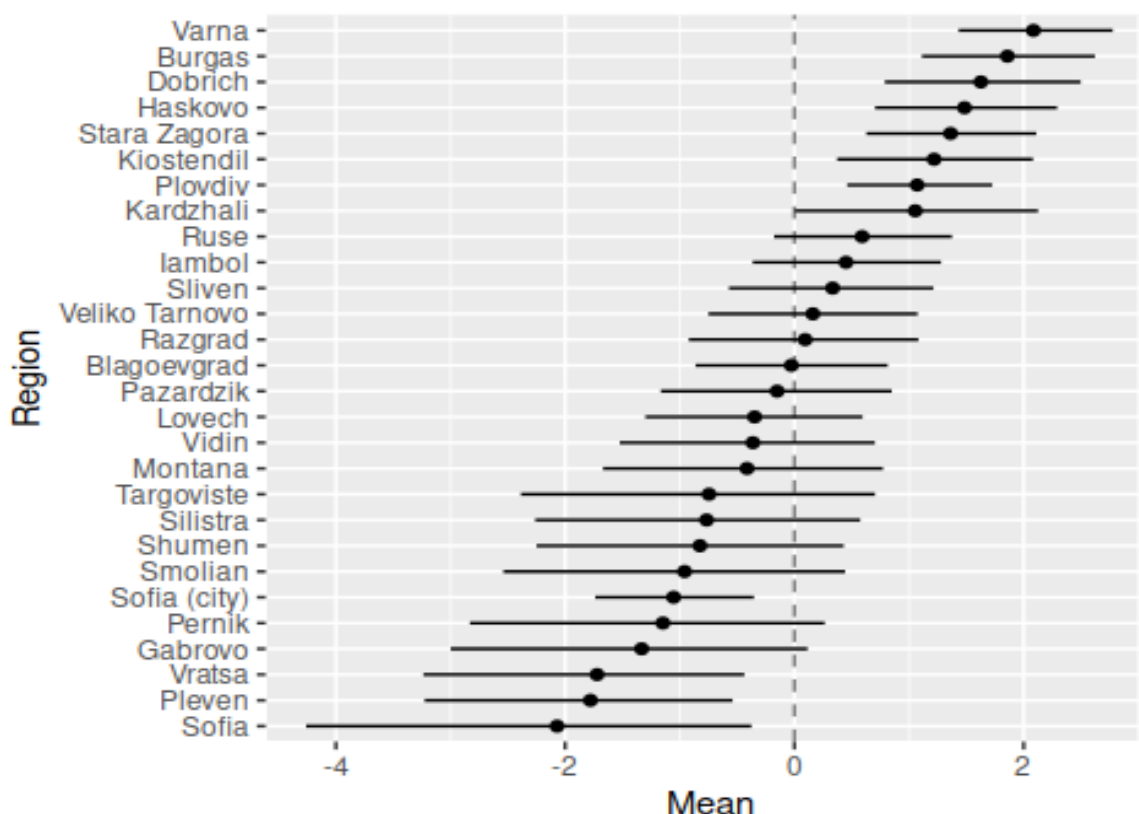
*Figure 1: Estimated regional random effects for healthcare-related services. Posterior means
and 95% credible intervals
(Source: own calculations)*

Regarding healthcare-related services, we expected retired persons to exhibit a higher usage
probability because of their higher demand for such services in general and because the
COVID-19 outbreak rendered visits to healthcare institutions both dangerous and cumbersome.
The model show only weak evidence that this is the case. Although the coefficient of the
retirement indicator variable is positive, the posterior probability that it is greater than zero is
only 0.84. Even though the sample consists of internet users, the propensity to use all three
service types varies with the respondents' education and the self-reported degree of ICT skills.
Low educational attainment and low ICT skills are associated with a low probability of using
all three types of services. In contrast to Bélanger & Carter (2009), the model suggests that prior
experience with commercial electronic services, measured by the online shopping frequency,
is positively associated with the propensity to engage with all three types of e-government
services. Table 3 presents a summary of the posterior distribution variance parameters of the
region-level intercepts. All three standard deviations have 95% credible intervals bounded away
from zero, pointing to regional heterogeneity in e-government adoption even after accounting
for the other explanatory variables in the model. The heterogeneity is largest for healthcare-
related services: the estimated effects (Figure 1) show that residents in the regions of Varna and
Burgas, which contain two of the largest cities in Bulgaria, had a higher adoption propensity
than the rest of the regions. This finding is noteworthy because non-users were oversampled in
these two cities. The correlations between the regional intercepts across service types (Table 3)
are all positive, but the evidence of positive correlations is weak. The 95% credible intervals of
all correlations include zero, implying that respondents living in a region with high adoption
propensity for one service type were not necessarily more prone to use the other services types
as well.

5. CONCLUSION

The analysis shows a continuing digital skill divide in Bulgaria concerning e-government adoption. Highly educated persons with high-level ICT skills and experience with commercial online services are more likely to adopt e-government services. This result may point to complexities in the online delivery of these services that discourage lower-skill individuals. Many e-government services in Bulgaria require a personal electronic signature that may be difficult to handle for citizens with low ICT skills. About 40% of the respondents not using any e-government mentioned access restrictions to these services as the reason for abstaining. The analysis showed that elderly internet users are not more likely to access electronic healthcare-related services than persons of active age, despite their tendency to use the healthcare system disproportionally more than younger persons. This behavior can be explained by a persisting digital divide where the older generation is more hesitant to switch to digital technologies, especially in areas where they have well-established habits. For example, an information campaign about the availability and benefits of healthcare-related services by family doctors and easier-to-use online applications may open the door for these digital services to the elderly. The adoption rates of e-government services vary between the 28 administrative divisions of Bulgaria, even after accounting for the respondents' socio-demographic and economic characteristics and digital skill levels. This result may inform policy decisions about informational and educational campaigns in low-adoption regions and encourage further research into success factors in the better-performing regions.

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COVID-19 AS A FACTOR FOR THE DIGITALISATION IN HUMAN RESOURCE MANAGEMENT IN THE BULGARIAN FINANCIAL INSTITUTIONS

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ABSTRACT
The financial sector is the basis of money circulation in any economy. Regardless of war and disease situations, this sector is to ensure the functioning of all other branches of the economy. Covid-19 posed such a challenge to the institutions from the financial sector. In many government decisions in the EU to impose a lockdown as a measure to curb the pandemic, the financial sector was among the exceptions to the suspension of activity. It is the functioning of commercial banks, insurance companies and pension funds that is a guarantee for the prospect that any crisis can and must be overcome. The pandemic itself logically put the general management of companies from the financial sector to the test. Pragmatic solutions were based on the achievements in information technology and digitalisation in the field of financial services provision. The internal process, which remained behind the scenes, was related to the rapid adaptation of the management structures and personnel of financial companies to functioning in an epidemic environment. This process was realised without interrupting the communication and services channels to the other economic agents - government, companies and households. Against this background, this research aims to establish, through a survey among the senior management of Bulgarian financial institutions, the effect of Covid-19 on the digitisation of human resource management. The compiled questionnaire and the collected responses from CEO and HR directors of banks, insurance companies and pension funds gives grounds to confirm that in the force majeure environment of the epidemic, innovations in and adaptation of human resources management have been implemented. This is based on the accelerated digitalisation of internal management processes in their entire spectrum – recruitment, operational labour performance, retirement and resign. In parallel, financial enterprises confirm the sharing of corporate social responsibility values in the context of Covid-19 through donation campaigns to support the healthcare sector.
Keywords: HRM, Digitalization, Covid-19, Financial Institutions

1. INTRODUCTION
The financial sector plays a crucial role in any economy as it helps businesses flourish, contributes to the growth of the capital market and maintains the balance in the economy. In turbulent times, like wars or pandemics, its importance is even higher, as it is the functioning

of banking and financial institutions that is at the heart of coping with the consequences of such crises. As at present the world has been struggling to recover from such a disruptive challenge, the Covid-19 pandemic, it is highly relevant to investigate the impact of it on the financial sector institutions so that we are able to find ingenious solutions and provide for insights into what is to be done next. There is no doubt that the Covid-19 pandemic has had numerous negative effects worldwide. Apart from the dramatic loss of human life, it instigated a global economic downturn and led to the emergence of a complex and challenging environment for governments, organizations and employees (Hamouche, 2021). To sustain their business or because they had no choice but to continue operating, many companies were forced to reorganize their activity in a way that would prevent the disease from spreading in the workplace. To do so they turned to exploring the opportunities technology offers, which in turn brought a number of workforce issues. Because of the importance of the financial sector and its specifics, an investigation of how human resource management (HRM) practitioners from it have handled these issues, can provide helpful insights into the main challenges and opportunities they have faced. In the light of the above, the paper aims to investigate the impact of Covid-19 on the process of digitalization in human resource management in Bulgarian financial institutions and provide for insights into future directions in this process. It is structured in four main parts. The first part establishes the context of the research, explains its relevance and states its purpose and presents the remaining structure of the paper. The second part reviews key scholarly sources on Covid-19 and HRM in financial institutions. The third part presents methodology and results from a survey among Bulgarian banks, general insurance companies and pension funds and discusses the findings from the conducted survey among the senior management of Bulgarian financial institutions. Finally, the conclusion summarizes the key points and gives directions for future research on the topic.

2. COVID-19 AND HRM IN FINANCIAL INSTITUTIONS

The digitalization of the operations of financial institutions had begun long before COVID-19, but, as in many other industries, the pandemic acted as an additional catalyst for this process, because as cash is a potential carrier of viruses, it was highly advisable to avoid its use as much as possible. This has naturally contributed to growth in the adoption of the digital payment method (E-wallets and contactless cards benefitting most) and (Pearce, Borkenhagen, & Gross, 2021) in "Buy Now, Pay Later" (BNPL) (users forecasted to quadruple by 2026, the share in B2B 15 % up for the same period) (Research and Markets, 2022). In the insurance sector the catalysing effect has been even more impressive, which is quite natural as, on the one hand, prior to the pandemic it had been less digitalized compared to the banking sector, while, on the other hand, perceptions of risk changed quickly during it, as did the type of help people looked for when evaluating insurance products. Therefore, the businesses from this sector had to quickly adapt their approaches to service delivery to ensure continuity of business operations, manage solvency and liquidity risks and provide support for their policyholders in an emergency situation (OECD, 2020). This logic is supported by recent research, too: according to a global survey of Insurance CEOs conducted by KPMG International, 85% of respondents say COVID-19 has accelerated the digitization of their operations and the creation of next-generation operating models, 78% state it has turbo-charged progress on the creation of a seamless digital customer experience and 79% - that it has brought new urgency to the creation of new business models and revenue streams (KPMG, 2020). Against the background of this quite brisk growth in demand, financial institutions had to find, almost overnight, ingenious ways to safeguard their employees, transform their operations and serve their customers in the conditions of an emergency situation.

Thus, they had to quickly mobilize their control centres and enable their employees work remotely, close branches and reconfigure, augment and secure operations to support changing volumes and business continuity as well as to adapt their risk and fraud models (Lipp, 2021). For the HR managers and specialists in the companies from the financial sector the task was especially complex and challenging, as since these companies are heavily dependent on the labour factor, the efficient human resource management is crucial for the economic results of their activity. The COVID-19 pandemic put to a serious test the skills, talent and experience of many HR managers and teams worldwide. Almost all of a sudden, they had to provide for the brisk transition of the majority, if not all, employees from office environment to work for home. This spurred a number of issues like maintaining remote work, staff absence and transfer, providing for the involvement of the employees and the right communication channels and tools for aligning them with organizational goals, and last, but not least - ensuring the employees' safety, health and well-being. As a pandemic event can also be very worrying for many employees who may be dealing with medical issues, personal issues, absence of support systems like schools or day-care, higher levels of work stress and anxiety (Singh, 2022), the role of HR specialists in handling such issues was of crucial importance. Because of the nature of the activities performed in the financial services space, performing the above-mentioned tasks was even more challenging in the financial institutions. Due to the specifics of the work in these companies, there are a few critical operations (like treasury, settlements, etc.) that still require employees to be in the office. During the pandemic, this was done usually on rotational basis. However, it involved reinforcing hygiene and cleaning protocols, providing for care packages, issuing guidelines for keeping branch personnel physically separate and other. Then, remote work was an exception for most financial companies before the pandemics, only 29% of employers having 60% of their employees working from home at least once a week (PwC, 2020), which suggests infrastructure, technological skill and security problems related to the quick transfer of the activity. However, it seems that the financial firms had the technology in place to keep things running and that most of the problems were related to other factors like employee motivation, difficulties collaborating and difficulties in getting the information they needed (PwC, 2020). This infers that providing for the involvement of the employees and the right communications and tools were one of the most challenging issues the HR managers had to resolve during the pandemic. Another problem the HR managers faced was how to cope with the array of employee-wellness-related issues ranging from sickness to mental health, as the (in some cases large-scale) absenteeism over a significant period of time (due to illness, official lockdown or personal concerns) can disrupt business continuity, reduce productivity levels, as well as have a detrimental effect on remaining staff. Moreover, the financial services sector was already struggling with shortage of skilled labour before the pandemic (CERIDIAN, 2020) and the need of overnight switch to remote work revealed some gaps in the workforce policy of these companies which are to be addressed in future. It is expected that in resolving these workforce issues HR managers were largely assisted by modern technologies. Solutions facilitating communication, team collaboration and project management, innovative onboard systems for hiring and onboarding would help them keep employees engaged and involved and facilitate collaboration and employee performance control. Therefore, an investigation of to what extent and in which ways human resource management (HRM) practitioners in financial institutions have relied on these solutions during the pandemics, can provide helpful insights into the issues to be resolved and the actions to be taken in future. Finally, we cannot but note the high financial commitment in corporate social responsibility (Ivanovic-Djukic, Zahariev, & Lepojevic, 2021e) of the financial institutions and businesses during the Covid-19 pandemic. These organisations readily supported the wave of solidarity in aid of the health sector to overcome the shortage (Zahariev A. , 2021d) of consumables, medicines (Adamov, Kolev, Vrachovski, Zahariev, & Marcheva, 2010) and equipment for treating people with Covid-19

(Antwi, Zhou, Xu, & Mustafa, 2021). In view of the important role of HR professionals in terms of attaining the CSR goals of their organizations (Moris, 2018), their contribution in this aspect is irrefutable.

3. METHODOLOGY AND MAIN RESULTS
3.1. Methodology
The empirical data for this research was collected through a survey, which comprised questions pertinent to the basic characteristics of the respondents and the management of human resources in the COVID-19 environment. The survey was sent to the central offices of the licensed financial enterprises in Bulgaria. The respondents were given an option to choose whether to fill out the answers online in Google forms, or to do this using the paper version of the survey. The total number of respondents was 50, including 17 banks, 23 insurance companies and 10 pension insurance funds. Valid responses were received from 20 respondents, which is a response rate of 40%. Most Covid-19-related questions were based on a five-point unipolar Likert scale, where 1 = "Strongly disagree"; 2 = Disagree; 3 = "Undecided"; 4 = "Agree" and 5 = "Strongly agree". The survey data was entered and processed in MS Excel. The survey questions were structured in sections that cover all aspects of digitization in human resources management. Emphasis was also placed on the relationship of Covid-19 with the need for new investments (Zahariev, Angelov, & Zarkova, 2022a), and hence on the direct impact on the financial indicators of the studied companies (Zahariev A. , et al., 2020b). The object of study are not only the classic aspects of human resources management (Zahariev & Zaharieva, 2003), but also the specific indicators in the conditions of Covid-19 regarding absences from work and sick days used by staff (Zaharieva & Sylqa, 2020). The epidemic macro-environment in which financial institutions had to operate and the introduced by the European Central Bank derogations on loan payments (Zahariev, et al., 2020a) suggest adapting the customer service tasks in banks, insurer and social security companies (Terziev, 2020). In practice, supply chains (Laktionova, Dobrovolskyi, Karpova, & Zahariev, 2019) in a Covid-19 environment have been changing their organizational structure, both in the real and financial sectors. This also requires a corresponding change in human resource management procedures and *in medias* training (Nenkov, Dyachenko, Petrova, Bondarenko, & Pustovit, 2017), (Diachok, Chernukha, Tokaruk, Udovenko, & Petrova, 2020) to financial services adapted for Covid-19 based on the digital opportunities opened by Industry 4.0 (Zahariev A. , et al., 2022a), (Occean, Stephan, & Walsh, 2021), (Samson & Agrawal, 2020).

3.2. Main results
The data obtained from the survey conducted in the period July-August 2022 outline the following main characteristics of the sample:
- Most enterprises (45%) were founded at the beginning of the transition period 1990-1995, 40% after 1995 and only 15% in the period before the transition to a market economy.
- Half or 50% of the respondents are insurance companies, 40% are credit institutions and 10% are pension funds.
- The interviewed insurance companies form 65.35% of the gross premium income of the Bulgarian general insurance sector as of 30.06.2022. It is specific to the researched market that there is a wide development of the network of insurance brokers (Zahariev A. , et al., 2020d), which redeploys staff from non-life insurance companies to insurance intermediaries.
- The interviewed credit institutions are commercial banks, licensed by the BNB that manage 70.04% of the assets in the banking system of the national market as of 30.06.2022.
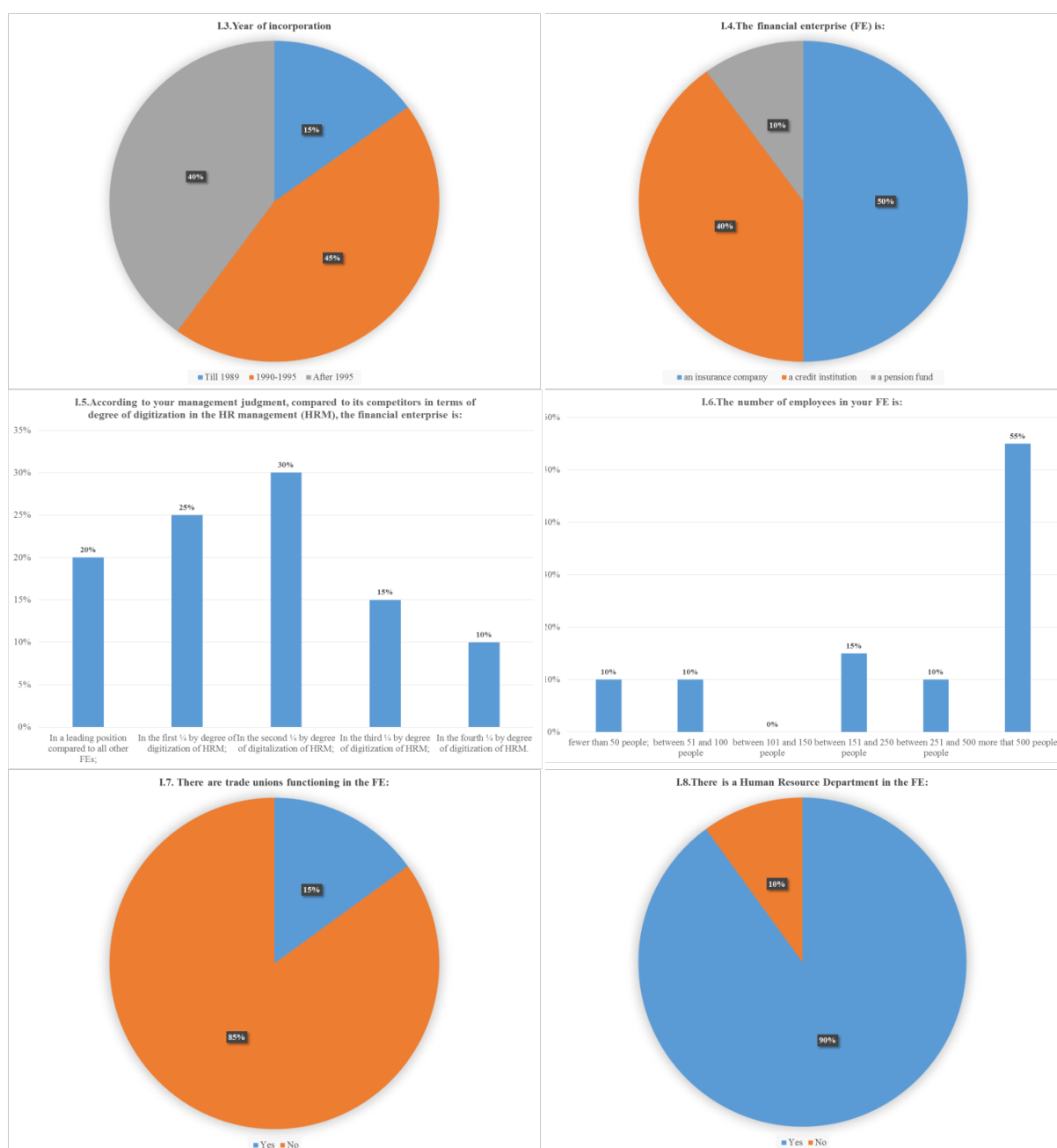
Figure 1: General description of the sample of financial enterprises in Bulgaria according to data from the survey as of 31.08.2022.

- Financial enterprises occupy a different position in terms of degree of digitalization compared to their competitors, with the largest share (30%) of those who are in the second quarter in terms of degree of digitalization, and 20% are considered industry leaders according to this indicator.
- Based on the number of employees, more than half of the companies (65%) are categorized as large, 25% as medium and 10% as small enterprises.
- There is an operating trade union in 15% of the companies.

According to the answers of the respondents, in 40% of the FEs, digitization influences their overall activity to an extremely large extent, and in 15% of them it affects all processes. Digitization is emerging as an important tool in the fight against the negative consequences and restrictions imposed by the pandemic.

According to the data, 55% of the interviewed managers agreed with the statement that the company's digital HR management systems enabled the management to adequately respond to the Covid-19 epidemic, the remaining 45% strongly agreeing. In the period of the Covid-19 pandemic, financial enterprises have taken various measures to prevent and protect the health of staff, which has also been confirmed in other international studies (Abuselidze, Bilyak, & Mračkovskaya, 2021). This is also supported by the collected responses, 70% of which express strong agreement, and 30% agreement with statement IX.2. To a large extent, the expectations for adjustments in working hours, suspension of work, overtime work, etc. in the conditions of a pandemic are also justified. More than half (60%) of the managers strongly agreed with the statement that working hours, overtime, work stoppages, etc. in the FE were tailored to the current epidemiological situation in the country, while 35% expressed an agreement with this statement. Regarding the impact of the pandemic on working conditions, 75% of the managers strongly agreed and 20% agreed that there was such. Only 5% of the respondents disagreed with the statement that the working conditions in the FE were consistent with the epidemiological situation. The majority of FEs have donated considerable funds to other institutions during the pandemic period. The managers of 65% of the FEs declared strong agreement or agreement with the statement that the enterprise they manage has donated significant funds for the purchase of medical items to help various institutions in the fight against the virus.
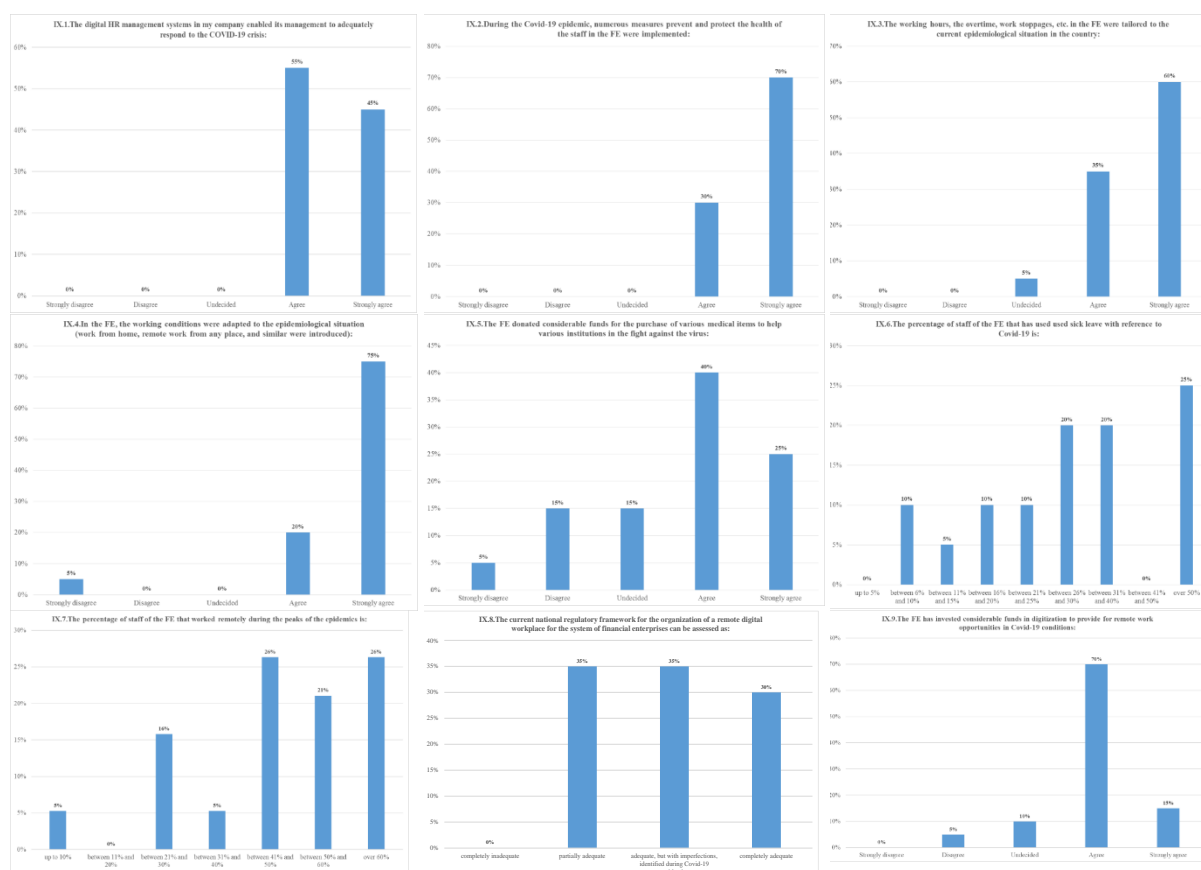
Figure 2: Results of the study of the relationship between the digitization of human resources management in financial enterprises in Bulgaria and the Covid-19 pandemic

In the period of the pandemic, a significant part of the staff went on sick leave, the percentage ranging between 5% and over 50% of the employees in the FP. The data show that in 25% of the enterprises over 50% of the total number of employees used sick leave, in 20% of the enterprises between 31% and 40% and in 20% - between 26% and 30%.

The percentage of the staff that worked remotely during the peak of the epidemic varies by FEs. The responses show that in a significant share of the enterprises (73% of the sample) more than 41% of the total number of employees worked remotely. Only 5% of respondents claimed a low percentage (up to 10%) of remote work. The data indicate that FEs are not fully satisfied with the legislative framework in this aspect. Only 30% of them evaluate the regulatory framework for the organization of a remote digital workplaces in the financial enterprises as fully adequate, 35% as adequate, but with imperfections, identified during the Covid-19 crisis, and the remaining 35% as partially inadequate. At the same time, a large number of respondents indicate that significant investments in digitization have been made by the enterprise to secure remote jobs in the conditions of Covid-19. Of all respondents, 70% agreed with this statement, and 15% strongly agreed.

№	Question / Statement	Ave	SD	CV
1	IX.1.The digital HR management systems in my company enabled its management to adequately respond to the COVID-19 crisis	4.45	0.51	11.47%
2	IX.2.During the Covid-19 epidemic, numerous measures prevent and protect the health of the staff in the FE were implemented	**_4.70_**	**_0.47_**	**_10.00%_**
3	IX.3.The working hours, the overtime, work stoppages, etc. in the FE were tailored to the current epidemiological situation in the country	4.55	0.60	13.29%
4	IX.4.In the FE, the working conditions were adapted to the epidemiological situation (work from home, remote work from any place, and similar were introduced)	4.60	0.94	20.44%
5	IX.5.The FE donated considerable funds for the purchase of various medical items to help various institutions in the fight against the virus	_3.65_	_1.18_	_32.39%_
6	II.9.The FE has invested considerable funds in digitization to provide for remote work opportunities in Covid-19 conditions	3.95	0.69	17.38%
Legend: 1 =„Strongly disagree"; 2=„Disagree"; 3=„Undecided"; 4=„Agree" и 5=„Strongly agree"				

Table 1: Statistical distribution of answers of Covid-19 and HRM digitalization survey among Bulgarian financial enterprises (31.08.2022)

The final part of the evaluation of the collected data is based on an analysis of the deviations from the average of the answers to the questions on the Likert scale (Table 2). The analysis of the results shows that there is the highest consensus by the respondents in terms of the degree of implementation of multiple measures for the prevention and protection of the health of the staff in the financial enterprises. The managers of the twenty financial companies participating in the survey formed consensus answers in the highest positive part of the unipolar Likert scale of 4.70 with a standard deviation of 0.47 and a coefficient of variation from mean of only 10%. At the other pole is the result to the question regarding corporate social responsibility policy ("The FE donated considerable funds for the purchase of various medical items to help various institutions in the fight against the virus"). The responses to this statement give a mean of only 3.65, a standard deviation of 1.18, and a coefficient of variation of 32.39%. The distribution of the answers itself indicates that 65% of the surveyed financial enterprises take a position in the positive component of the scale (answers "4" and "5"), 20% in the negative one (answers "1" and "2") and the remaining 15% are neutral (answer "3"). The cross-sector analysis does not confirm a relationship between the market share of the financial enterprise and the propensity to donate in the conditions of Covid-19.

4. CONCLUSION

The study of the relationship between Covid-19 and the digitization in human resource management in financial enterprises in Bulgaria is the basis for important conclusions and recommendations to economic sectors managing assets of value 1.5 times the annual GDP of the country. The technological evolution of the banking and insurance systems in terms of digitization of customer service offered quick solutions in the direction of the digitization of human resource management itself. Thus, Covid-19 not only played the role of a stress test for the functioning of the financial system in a pandemic environment, but also proved to be a factor in the accelerated digitization of banks and insurers. This conclusion can also be applied to the public sector (Sabitova, Shavaleyeva, Lizunova, Khairullova, & Zahariev, 2020c) and to the business sector regardless of formed deficits (Zahariev, Radulova, Aleksandrova, & Petrova, 2021) and sharp market imbalances caused by the pandemic.

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THE CHALLENGE OF BEING AN ONLINE MARKETER

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ABSTRACT
In times of advanced information technologies and global digital services, online trading is gradually becoming more and more sustainable in world markets. E-commerce initially gained popularity in the US, then gradually entered Europe. Based on international practices in this field, online transactions reveal potential for building a sustainable business model in Bulgaria as well. Currently, more and more companies carry out their activities relying solely on network communication with their customers. Based on this trend, the question is what is the degree of security of the economic environment for the companies that operate in this sphere. Online trading allows entrepreneurs to go beyond our national territory and enter international markets. Of course, this leads to the discovery of new opportunities for attracting foreign capital, as well as the need to comply with a number of legal norms introduced by European legislation. The main goal of the change in tax regulation is to implement stricter control over the commercial activity of companies. The choice of the right strategy for the realization of the products and introduction with the legal regulations concerning the transactions carried out are of key importance for the successful development of the business.
Keywords: digital services, e-commerce, economic environment, european legislation

1. INTRODUCTION
In recent years, online business has been characterized by a trend of continuous development. The spread of online transactions is observed not only in the USA, but also in Europe. The main reason for this growth is consumer interest in online shopping. It creates for them a number of conveniences and advantages over the standard visit to the commercial establishments. Among the main ones are the saving of time and the possibility of choosing from a wide range of products with options to compare their characteristics between individual manufacturers. The presence of consumer interest, in turn, leads to the emergence of sellers who, finding the appropriate market environment, strive to make a profit. E-commerce allows starting a business with a significantly lower initial capital investment compared to traditional business models. One of the main challenges facing online marketers is the need to use a network that provides them with access to as many potential customers as possible. For electronic transactions, the advertising factor is extremely important. When the offered product reaches a larger number of users, then the volume of realized sales increases. Another important point for e-commerce is the change in the European legislation of the tax treatment of online transactions from companies to consumers on the territory of the European Union. This, in turn, leads to the need for entrepreneurs to receive tax advice from accounting specialists already at the stage of starting the activity, in order to familiarize themselves with the requirements of the tax administrations and not to operate in violation of the law. Online trading is characterized by an international manifestation. The globalization of transactions leads to the realization of products all over the world. This reflects on the economies of individual countries, creating an opportunity for future development by attracting foreign capital.

2. CHOOSING A PROFITABLE PRODUCT
In the online space, consumers are numerous and each of them has their own personal preferences for the products they buy. It is important for any online retailer to offer those products that are in demand by consumers.

Of course, in such an environment there are many competitors and the seller is faced with the difficult task of distinguishing his product from all the others. Always key to market advantage is offering a quality product that is accompanied by a complete description and that is advertised at a price that is affordable to customers. Quality is extremely important, because even after an order has been made and paid for by the customer, there is the possibility of the product being returned. Another important point is to allocate enough time for the announcement of the products and to observe a certain sequence in their presentation. The Internet environment is dynamic and adapting to the current situation is crucial to making a profit. To a greater extent, online business is related to a commercial activity where the seller pre-purchases the goods from a third party (another merchant or manufacturer). In this regard, it is necessary to find and partner with suppliers to ensure timely supply of goods, in order not to delay customer orders.

3. PROVIDING A CHANNEL FOR PRODUCT SALES

The Internet is the medium through which communication is achieved between sellers and buyers. The ways to make this connection are either by using your own sales site or by advertising and selling products through various websites and platforms by creating accounts on them. The creation and development of one's own site is associated with the need for investment both in its creation and technical support, as well as in good advertising activity in order to gain greater popularity among users. To date, a widely applied practice is to use the services of platforms that have established their name in international markets, where a large customer flow is observed. Every day they are visited by millions of users who have the desire to buy goods. Among the most common ones are Amazon and Ebay. They successfully develop their activities on the territory of more and more countries and occupy the leading positions in the field of online sales. The organization of their activity is associated with the provision of the service of online merchants from different countries to create accounts that provide access to the announcement of products on their sites against the payment of commissions. Apart from the fact that this method of commercial activity has a global scope, another important advantage is the way of settlement of payment relationships. On the one hand, customer payments are processed by the platform itself, after which the money is transferred to the seller's account in tranches, and on the other hand, commission obligations are deducted from the transfers themselves, which saves sellers the task of making bank transfers for their obligations to them. Online trading itself also has its varieties. In the Internet space, you can trade with goods that you have purchased in advance or that you have produced, but it is also possible to carry out transactions without actually owning the goods themselves. This form of online trading is known as dropshipping. With it, the seller does not acquire ownership of the products. The customer placed an order with him, but the goods are delivered by a third party. These deals are more speculative in nature, aiming to profit from the higher price at which the product can be sold. There are other ways that sellers can market their products. Amazon, for example, offers a service that allows merchants to ship goods to their warehouses in order to achieve faster movement of orders to end customers. This service also includes the organization and movement of goods between their fulfillment centers in different countries. Amazon and Ebay have established a favourable environment for many e-commerce oriented startups. The organization of work is related to the creation of accounts that must meet certain requirements. In Bulgaria, the creation of such companies gives rise to the need to provide documents for the establishment and entry of the company in the Commercial Register, VAT registration of the company, as well as an available bank account of the company. It is a known fact that not every account registration is successful. There is also the possibility that an active account will be closed, thereby stopping access to the online merchant's sales.

Therefore, it is recommended not to work with only one account. Although there are also unsuccessful attempts to develop online commerce, a large number of online entrepreneurs manage to build a successful business model and realize significant profits.

4. TAX LEGISLATION IN THE FIELD OF E-COMMERCE

From July 1, 2021, new rules regarding the distance sales of goods from companies to consumers are valid on the territory of the European Union. According to the EU Regulations and Directives that have taken effect, the tax legislation of each member state applies the new norms for the reporting of sales. On the one hand, these changes were made to facilitate and promote the development of online business, but on the other hand, they are also related to the achievement of stricter control over the commercial activity of companies. The initial tax consultation in the field of e-commerce is associated with the need to become familiar with the three new VAT regimes in operation - a regime in the Union, a regime outside the Union and a regime for importing goods from third countries or territories. Depending on the nature of the supplies, in the presence of the requirements defined in the law, the online platforms and websites themselves, the so-called electronic interfaces are deemed to facilitate the supply of goods, which gives rise to their obligation to collect VAT from end users. According to the new tax imperative, all goods that are allowed to be traded on the European markets are subject to VAT. At the same time, the VAT is payable in the Member State of the European Union where the final consumers of the goods are located. This requirement must be met upon reaching a sales amount of EUR 10,000 within the calendar year. Crossing this threshold requires a choice between two options - one is VAT registration in each member state where goods are sold, and the other is registration under a new special VAT regime. This regime is known as the Union regime and amounts to VAT registration only in one Member State of identification in which the seller's business is established. In practice, this involves registering an OSS (ONE-STOP SHOP) or IOSS (IMPORT ONE-STOP SHOP), after which the VAT due for sales in the various Member States is paid only to the territorial directorate of the Revenue Agency. The increased control over the activities of the companies comes down to the requirement to keep and store electronic registers for all sales made. These registers serve as a documentary justification for the correct application of legal norms. The taxable persons operating the websites or platforms also keep electronic records of the sales of all traders using their services for listing goods. At the request of the tax authority, the registers of the online trader and the taxable persons managing the electronic interface can be compared in order to establish the correct reporting. So far, the highlights of the tax legislation describing the online transactions carried out in the territory of the European Union have been mentioned. As already discussed, e-commerce provides opportunities for the realization of products all over the world. According to Bulgarian tax legislation, supplies of goods sent or transported outside the territory of the European Union are taxed at a zero tax rate. This provision applies to deliveries to third countries or territories, regardless of whether the dispatch or carriage of the goods is at the expense of the supplier or the consignee.

5. IMPACT OF ONLINE COMMERCE ON COUNTRIES' ECONOMIES

By selling goods in different parts of the world, companies manage to generate cash receipts within the country in which they operate. In this way, it also reflects on the country's balance of payments. To a large extent, these monetary resources are invested in the expansion of the activity within the national unit, which leads to the economic growth of the state. On the other hand, companies are subject to taxation with an annual profit tax from their activities, which tax is referred as income to the state budget. In Bulgaria, final tax is also imposed on the distribution of dividends from the retained earnings to the owners of the company.

In general, the dynamics of online trading leads to an acceleration of the circulation of funds and the movement of commodity flows. The globalization of the economy allows for the possibility of choosing from a wide range of goods from different manufacturers around the world. The highly competitive environment, in turn, stimulates innovation and research activities.

6. CONCLUSION

The technological world in which we live provides the opportunity to establish business relationships between participants from all over the world. The dynamic everyday life and the increasing dependence on information technologies are a prerequisite for the increased interest in online trade. In the US and West Europe countries, online shopping and cashless virtual payments are part of consumers' daily routine. In Bulgaria, at the moment, the share of standard postal money transfers is still high. Creating an online business is an attractive option for many young entrepreneurs. The main reason for this is the lower initial investment in material base and staff. At the same time, the possibility of reaching an unlimited number of users in the Internet space stimulates the supply of various goods. First of all, starting an internet sales business requires the selection of profitable products that the seller can stock up on to fulfill their customers' orders in a timely manner. In the second place, of extremely important importance is the provision of a channel for the realization of the products. Using the services that the various websites and platforms provide against the payment of commissions is the mainstream option for developing this type of business. Creating accounts with them is also about taking responsibility for offering quality products, as customers have the right to file a complaint and return the product when they are not satisfied with it. An important point in online trade is the most complete possible presentation of the product in the virtual space through the presence of photos and a detailed description of the characteristics. This is essential for consumers as they do not have direct access to the goods. In addition to meeting the already listed criteria for a successful start of the business venture, familiarization with the tax laws and norms valid for this type of transaction is also necessary. EU member states have different rates of VAT, which means you can choose to sell in countries with lower VAT rates. Online marketers face many challenges to establish and grow their business in the market. Of course hard work is a basic prerequisite for generating profits. The main advantage is the possibility of selling the products in countries with better purchasing power of customers, where the standard of living is higher.

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EVALUATION AND COMPARATIVE ANALYSIS OF THE MARKET LIQUIDITY OF EXCHANGE TRADED SHARE ISSUES (IN THE CONDITIONS OF A PANDEMIC AND THE WAR IN UKRAINE)

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ABSTRACT

Based on the conducted here empirical study of the market liquidity of companies from the oil, electricity, pharmaceutical and banking sectors, traded on the stock exchanges in Stockholm, Copenhagen, Zagreb and Sofia, we summarize the following practical conclusions: It was found that the share issues of companies from the four sectors traded on the two Scandinavian stock exchanges have very good market liquidity, with most of the Swedish ones showing, albeit by a small margin, higher than the Danish ones. As expected, the market liquidity of shares from the two Balkan stock exchanges is significantly lower. Accordingly, Croatian companies from the oil, electricity and banking sectors show better market liquidity than Bulgarian companies. The parallel cut between the four sectors arranges the companies in the following sequence: pharmaceuticals, banks, electric power and finally petroleum. We also find some decrease in market liquidity for the second period accompanying the war in Ukraine (July 2022), relative to the pandemic restrictions of December 2020. As a result of the analyzes on the methodology of market liquidity measures, we synthesize the following more significant conclusions: For the practical application and study of the models for market liquidity of share issues, it is essential to consider them from the point of view of the included indicators - price and/or natural. Many of the measures of market liquidity lack sufficient popularity, and publications of a critical analytical nature on the applicability of particular measures are insufficient. Due to the methodological specificity of the gauges based solely on price indicators and the possible errors resulting from this, we recommend the application together with combined models and more complex naturally-based ones. The Natural Complex Coefficient of Relative Market Liquidity showed clearly comparable results for all studied companies in the theoretical range from 0 to 1. Unlike this model, the others lack a finite scale, which makes it difficult to be precise in interpreting their results.
Keywords: Market Liquidity, Coefficient of Elasticity of Trading, Zero-Return Measure, Complex coefficient of the relative market liquidity

1. INTRODUCTION

Market liquidity is one of the three main characteristics of investment instruments, along with yield and risk. For those instruments, traded on stock exchange in developed capital markets,

market liquidity is generally taken for granted, so the attention of investors and academic researchers is often focused solely on returns and risk. A closer look shows that market liquidity is not a constant pattern, nor should it be expected to be the same even for instruments of the same class listed on the same stock exchange of developed capital markets. For emerging capital markets, the market liquidity is a fundamental and permanent issue (both at the micro and macro levels) that directly affects returns and risk. In view of this, the present study focuses on the market liquidity of share issues from several key economic sectors, traded on different scale Balkan and Central European stock exchanges, and the subject is the models for measuring the market liquidity of shares. We confirm the opinion expressed by Hio Loi in 2018, that "there is not a standard way to measure the liquidity of an asset or currency in the literature" (Loi & Hio, 2018). A quarter of a century ago from today's date, M. Aitken and R. Winn indicated that 68 liquidity measures were used in the literature (Aitken, 1997). On this basis, in this article we set ourselves the following main tasks: highlighting weaknesses of fully price models for evaluation market liquidity of shares, based on some critical considerations about the methodology; Measuring market liquidity and showing its differences for share issues of companies from the same sectors listed on different stock exchanges; To research changes in market liquidity of companies from several key sectors in periods of pandemic restrictions and the war in Ukraine.

2. SOME CRITICAL CONSIDERATIONS ABOUT THE METHODOLOGY FOR ESTIMATING MARKET LIQUIDITY OF SHARES ISSUES

In a study from 2014 Danyliv, Bland and Nicholas consider three groups of liquidity measures: "Price-based", "Spread-related" and "Volume-based" (Danyliv, Bland, & Nicholass, 2014). We should note here that spread-related measures also have a price nature. Based on our understanding for the importance of more natural trading indicators, not only trading volume, and also some specifics of price as a component of measuring market liquidity, we put three main categories of measures as follows:

- based on price indicators only;
- such that include price and natural trading indicators, and
- based entirely on natural trading indicators.

We can assume that price measures reflect market liquidity in its relation to the possible loss of value - a feature embedded in the definition of Lawrence Fisher, who considers liquidity of the market assets as their possibility to be sold and purchased quickly, and without significant loss on its value (Fisher, 1959). Without diminishing the importance of this really significant aspect of market liquidity, we share some methodological considerations that make us believe that pure price measures have a significant weakness. This understanding of ours is based on the objective possibility with shares of a company with a small market capitalization, a small number of trades and trade volumes, and even no everyday trading to realize consecutive trades with an insignificant price difference and even at the same price as previous trades. In this situation, the classic Amihud illiquidity coefficient (Amihud, 2002) will be of a very low value, which means very good (high) liquidity, but the actual state of such a shares issue is far from good. This methodological weakness applies to all entirely-price measures of market liquidity. With this opinion, we do not deny the usefulness of price measures, but emphasize the need entirely-price indicators to be applied in conjunction with natural indicators and with more complex measures. This recommendation of ours, and the criticism it is based on, applies more to analyzes of issues traded on exchanges with less activity and, in particular, to comparative analysis between issues traded on exchanges with larger differences in scale.

3. METHODOLOGY FOR EMPIRICAL RESEARCH

To visualize the commented methodological features and to conduct the empirical analysis, we select five models for evaluating market liquidity of shares issue, presenting them in the chronology of their creation (publication). The first four models are by world-famous authors, which explains the popularity of most of them. The fifth model was developed by the lead author in the present team and was published in 2018.

3.1. Amihud (Amihud, 2002)

$$ILLIQ_{iy} = \frac{1}{d_{iy}} \sum_{t=1}^{d_{iy}} \frac{|R_{iyt}|}{V_{iyt}} \qquad (1)$$

where:
d_{iy} is the number of days for which data are available for stock *i* in year *y*;
R – daily absolute return;
V – dollar volume.

We can define the Amihud coefficient as a price-kind gauge, since the daily yield is entirely a price function, and the "dollar volume", i.e. exchange turnover is formed by price and trading volumes. It should be emphasized that trading volumes are not included here as a stand-alone indicator, as well as our considerations about exchange turnover, which are subject of additional commentary.

3.2. The Zero-Return Measure of Lesmond, Ogden, and Trzcinka (1999)

As Je. Minovich notes, LOT's illiquidity ratio is a ratio of days with zero returns to actual trading days (Minovich):

$$ZR_{i,t} = \frac{N_{i,t}}{T_t} \qquad (2)$$

where:
$N_{i,t}$ is the number of zero return days of stock *i* in month *t*;
T_t - a number of trading days in month *t*.

It is important to note that the application of this model is limited to a significant extent due to the objectively small practical probability that the closing price for two consecutive trading sessions will coincide. Moreover, we do not think that there is a straight one dependence between the zero daily yield - on the one hand, and on the other - trading volumes and the number of transactions, which definitely form the market liquidity of the shares. However, we deliberately included this model in our current study because of the specificity in its logic and also to test its results in parallel with the other models.

3.3. The Coefficient of Elasticity of Trading, Datar (2000)

Datar (2000) expresses market liquidity as the elasticity of trade,

$$CET = \frac{\% \ change \ in \ trading \ volume}{\% \ change \ in \ price} = \sum_{t=1}^{T} \frac{Ln\left(\frac{V_t}{V_{t-1}}\right)}{Ln\left(\frac{P_t}{P_{t-1}}\right)} \qquad (3)$$

where:

V is the percentage change in trading volume, and

P - the percentage change in price.

Large values of the coefficient, whether positive or negative, indicate high liquidity (Loi & Hio, 2018), and those close to zero indicate poor liquidity.

3.4. The Zhang illiquidity measure for emerging markets (2010)

In 2010 Zhang introduced a newer version Amihud's illiquidity measure targeting emerging capital markets, with the following formula:

$$\text{ILLIQ}^{Zhang} = [\ln(ILLIQ)] \cdot (1 + NT\%) \qquad (4)$$

where:

NT% is the percentage of no-trading days within a month,

ILLIQ is calculated by Amihud's (2002), Formula-1.

3.5. Complex coefficient of the relative market liquidity, St. Simeonov (2018)

In search of a model that excludes the commented weaknesses of price models, we constructed a Complex Model for the market liquidity of share issues, based entirely on natural indicators (Simeonov & Todorov, 2018). Based on an analysis of the information value of each primary and secondary indicator of market liquidity, we have selected nine indicators as the most significant and sufficient for an objective comparison. Seven of the selected indicators are primary and we include them as relative or average values. In the complex formula with significant weight, we also include two secondary indicators – The Coefficient of trading days and The Coefficient of traded volume. We have compiled these two indicators specifically to measure the market liquidity of shares and give priority to their informational and analytical value.

TD(K)	Trading days coefficient
Tract.NDA(K)	Average daily number of transactions (Coefficient)
TVDA(K)	Average daily traded volume (Coefficient)
TV(K)	Traded volume (Coefficient)
FfNS(K)	Free float in number of shares (Coefficient)
Ff(%)	Free-float as a percentage
MCRW	Market capitalization relative weight in the aggregate one
SNI(K)	Number of shares in the entire issue (Coefficient)
SHN(K)	Number of shareholders

Table 1: Components of The Complex Coefficient of the Relative Market Liquidity, Simeonov

For the purposes of the complex assessment of market liquidity, we assign weights to the selected indicators. The weights in the complex formula objectively reflect both the relative importance of each particular primary and secondary indicator, as well as the total importance of complementary and similar indicators (such as: ratio of traded volume and average daily traded volume; free-float in percentage and free-float in number of shares; number of shares in the free-float and number of shares in the entire issue).[1]

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[1] The informational and analytical significance of the particular primary indicators selected and secondary indicators introduced for the construction of the complex formula, are discussed in the first publication of the model (Simeonov & Todorov, 2018).

Thus, we define a complex coefficient of relative market liquidity (CCRML) with the following expression:

$$CCRML = TD(K) * 0,26 + TN_{DA}(K) * 0,24 + TV_{DA} * 0,11 + TV(K) * 0,11 + Ff_{NS} * 0,08 + Ff(\%) * 0,08 + MC_{RW} * 0,04 + SN(K) * 0,04 + SH_N(K) * 0,04$$

For the purpose of comparability when including some of the components, we apply as a benchmark for the relevant indicator the value of the emission with its best value. Therefore, we emphasize that the current model (CCRML) defines and refines the relative market liquidity of companies and its importance is manifested in comparative analyzes between the liquidity of different issues and in the study of its dynamics. Due to the lack of publicly available information on free-float and number of shareholders for companies from the two Scandinavian and Croatian stock exchanges, here we reduce the components of the formula to six. Despite the importance of free float and the number of shareholders, we believe that the logic of the model can be demonstrated objectively. The total weight of the dropped three components in the original formula is 20%, which we distribute among the remaining 6, keeping their priority:

$$TD(K) - 0,32; TN_{DA}(K) - 0,28; TV_{DA} - 0,14; TV(K) - 0,14; MC_{RW} - 0,06; SN(K) - 0,06.$$

In accordance with the main criterion for classifying the models for assessing the market liquidity of share issues, which we set at the beginning (in the first paragraph), the five models selected for the present study are classified into the following groups:
- Entirely Price-based: Amihud 2002 и LOT's Zero-Return Measure, 1999;
- Including price and natural indicators: Coefficient of Elasticity of Trading, Datar (2000) и The Zhang illiquidity measure for emerging markets (2010);
- Based entirely on natural trading indicators: Complex coefficient of the relative market liquidity, Simeonov (2018).

4. JUSTIFICATION OF THE SAMPLE FOR THE EMPIRICAL STUDY

In accordance with the set goal, as the object of the practical research we choose sixteen companies from four key sectors of the economy: energy; oil industry; pharmacy and banking sector. To achieve the analytical tasks and more specifically - a parallel between the market liquidity of companies listed on stock exchanges with different degrees of development - on the one hand, and together with that between companies from the same region, the sample includes one company for the specified sectors from four European stock exchanges. Two of the stock exchanges are Balkan - Bulgarian and Croatian - capital markets, defined as developing. The other two stock exchanges are from Scandinavian economies: Sweden and Denmark, which refer to the developed capital markets and are not among the largest European economies, and represent a separate region. In accordance with the specified criteria, the selected companies are listed in Table 2.

Table following on the next page

Stock Exch. / Sector	Stockholm Stock Exch.	Copenhagen Stock Exch.	Zagreb Stock Exch.	Bulg.SE Sofia
Petrol industry	International Petroleum Corp	Atlantic Petroleum	INA	Petrol
Electro Energetics	Eolus Vind B	Green Hydrogen Systems	Končar	Eurohold
Farmacy	AstraZeneca	Novo Nordisk	Medica	Sopharma
Banking	Swedbank	Danske Bank	Zagrebcka Banka	First Investment Bank

Table 2: Object of the research, companies by sectors and stock exchanges

For the application of the five models mentioned above, in the empirical assessment of market liquidity, the necessary stock exchange data (price and natural indicators) were collected for the sixteen issue shares from the four sectors traded on the four stock exchanges. We calculate each indicator for two periods: the month of December 2020 - to track the state of market liquidity when the serious restrictions on economic and social activity to overcome the COVID pandemic were introduced; and for the month of July 2022 - the reflection of the war in Ukraine in the sixth month of the Kremlin invasion.

5. EMPIRICAL ESTIMATION OF SHARES MARKET LIQUIDITY

Stock Exchange	Stockholm Stock Exch.		Copenhagen Stock Exch.		Zagreb Stock Exch.		Bulg.SE Sofia	
Company	**International Petroleum Corp**		**Atlantic Petroleum**		**INA**		**Petrol**	
Period / Models	Dec. 2020	Jul. 2022	Dec. 2020	Jul. 2022	Dec. 2020	Jul. 2022	Dec. 2020	Jul. 2022
Amihud (2002)	0,000.00 0.002	0,000.00 0.000.5	0,000.0 00.4	0,000.0 00.3	0,000.0 02	0,000.0 01	0,54	0,002
Zero-Return (LOT, 1999)	0,05	0,05	0,05	0,05	0,1	0,0	0,0	0,04
Trading Elasticity (Datar, 2000)	0,60	-0,73	-1,71	-10,55	-51,98	-173,37	25,78	82,52
The Zhang illiquidity (2010)	-20,07	-21,52	-14,64	-15,05	-3,93	-4,83	-0,15	-1,65
Complex CRML (Simeonov, 2018)	0,36	0,43	0,36	0,33	0,13	0,13	0,08	0,08

Table 3: Liquidity assessment for oil industry companies traded on the stock exchanges of Sweden, Denmark, Croatia and Bulgaria

The calculations for the oil industry (Tab. 3) according to two of the models - the classic price model of Amihud (2002) and the combined model of Zhang (2010), clearly show the most liquid issue of the Swedish company, followed by the Danish, Croatian and the lowest for the Bulgarian. The Zero-Return indicator gives different results, with the shares of the Swedish and Danish companies having equal market liquidity and no change for both periods. The market liquidity for the Croatian and Bulgarian companies is significantly lower, but for the second period, the Bulgarian is approaching significantly that of the Swedish and Danish issues. Against this background, the results of The Datar 2010 model for Trading Elasticity, which are completely different from the previous ones, are striking. According to the coefficient of trade elasticity, the shares of the Croatian company are the most liquid, followed by the Bulgarian, the Danish and finally the Swedish. A significant - multiple difference in values between the two periods is also reported here, with the absolute difference following the same sequence. Of interest are also the results of The entirely-natural Complex CRML, which confirm the order

of the models of Amihud and Zhang. Regarding the periods, the Swedish issue improves its liquidity in the last month, the Danish one slightly lowers, and the Croatian and Bulgarian ones remain unchanged.

Stock Exchange	Stockholm Stock Exch.		Copenhagen Stock Exch.		Zagreb Stock Exch.		Bulg.SE Sofia	
Company	Eolus Vind B		Green Hydrogen Systems		Končar		Eurohold	
Period — Models	Dec. 2020	Jul. 2022	Dec. 2020	Jul. 2022	Dec. 2020	Jul. 2022	Dec. 2020	Jul. 2022
Amihud (2002)	0,000.000.000.7	0,000.000.009.6	0,000.000.01	0,000.000.02	0,000.000.5	0,000.000.5	0,000.01	0,000.02
Zero-Return (LOT, 1999)	0,0	0,0	0,05	0,05	0,30	0,19	0,1	0,0
Trading Elasticity (Datar, 2000)	0,21	1,65	-0,58	1,38	-264,96	-30,80	-1416,26	544,96
Zhang illiquidity (2010)	-21,13	-18,47	-18,02	-17,56	-10,87	-11,75	-7,13	-6,57
Complex CRML (Simeonov, 2018)	0,35	0,34	0,20	0,33	0,24	0,26	0,22	0,22

Table 4: Liquidity assessment for companies from the electricity sector traded on the stock exchanges in Sweden, Denmark, Croatia and Bulgaria

Calculations of emissions from the electricity sector (Table 4) according to *Amihud* and *Zhang's illiquidity* models confirm the sequence found for the oil sector. The Swedish company has the best values, followed by the Danish and Croatian companies, with the Bulgarian company having the lowest market liquidity. The change in market liquidity for the second period is insignificant, and here the values for the first investigated period are better. *Datar's Zero-Return Model* and *Trade Elasticity* results occur opposite for this sector as well. The results for the electricity sector from *Complex CRML* maintain the leadership of the Swedish company, but with a smaller margin compared to the other models. The companies from the other three exchanges show similar results.

Stock Exchange	Stockholm Stock Exch.		Copenhagen Stock Exch.		Zagreb Stock Exch.		Bulg.SE Sofia	
Company	AstraZeneca		Novo Nordisk		Medica		Sopharma	
Period — Models	Dec. 2020	Jul. 2022	Dec. 2020	Jul. 2022	Dec. 2020	Jul. 2022	Dec. 2020	Jul. 2022
Amihud (2002)	0,000.000.000.02	0,000.000.000.02	0,000.000.000.01	0,000.000.000.009	0,000.000.2	0,000.01	0,000.000.2	0,000.03
Zero-Return (LOT, 1999)	0	0	0	0	0,2	0	0,35	0,14
Trading Elasticity (Datar, 2000)	0,27	1,01	-0,33	2,18	30,50	-35,35	103,08	242,29
The Zhang illiquidity (2010)	-24,72	-24,58	-25,21	-25,46	-5,35	-2,58	-14,82	-10,24
Complex CRML (Simeonov, 2018)	0,68	0,55	0,82	0,78	0,11	0,06	0,33	0,27

Table 5: Liquidity assessment for companies from the pharmaceutical sector, traded on the stock exchanges in Sweden, Denmark, Croatia and Bulgaria

The results for the market liquidity of the share issues of companies from the pharmaceutical sector (Table 5) maintain the general tendency, showing a small difference from the previous two - energy sectors. Here the leadership is again for the companies from the Scandinavian stock exchanges, but the Danish pharmaceutical company Novo Nordisk is ahead, albeit by a small difference, of the Swedish AstraZeneka. The issued shares of the two Balkan companies are also grouped with almost equal market liquidity and a significant lag behind the Scandinavian ones. We can note that based on calculations related to the present study, as well as several previous ones, Sopharma is most often and continuously the leader in terms of market liquidity for the Bulgarian capital market. The changes in results between the two periods and for the four companies are different according to the particular models. A clear second-period decline in market liquidity for each of the four companies, albeit to varying degrees, is evident from the CCRML. According to the natural CCRML for the pharmaceutical companies, the ranking of the Amihud and Zhang models for the Nordic stock exchanges is confirmed. Their advantage over the Balkans is also clearly confirmed. Here, the Bulgarian Sopharma surpasses the Croatian Medica in terms of market liquidity. The results for shares of banking companies (Table 6) confirm the tendency of the previous three sectors. The market liquidity of the issues for the two Scandinavian companies is practically insignificant. The market liquidity of Zagrebcka Banka and, accordingly, of the Bulgarian FIB is significantly lower. Against the background of the differences between the two regional capital markets, the differences between the two periods for each of the companies are small.

Stock Exchange	Stockholm Stock Exch.		Copenhagen Stock Exch.		Zagreb Stock Exch.		Bulg.SE Sofia	
Company	**Swedbank**		**Danske Bank**		**Zagrebcka Banka**		**First Invest. Bank**	
Period ⟍ Models	Dec. 2020	Jul. 2022	Dec. 2020	Jul. 2022	Dec. 2020	Jul. 2022	Dec. 2020	Jul. 2022
Amihud (2002)	0,000.00 0.000.02	0,000.00 0.000.03	0,000.00 0.000.05	0,000.00 0.000.1	0,000.0 00.1	0,000.0 00.2	0,000 .01	0,000.1
Zero-Return (LOT, 1999)	0	0	0	0	0,2	0,1	0	0
Trading Elasticity (Datar, 2000)	-0,07	0,85	0,64	8,18	-66,38	3269,31	26,65	-306,80
The Zhang illiquidity (2010)	-24,61	-24,23	-23,79	-23,18	-15,27	-14,87	-10,55	-6,09
Complex CRML (Simeonov, 2018)	0,66	0,66	0,57	0,52	0,34	0,33	0,32	0,21

Table 6: Liquidity assessment for companies from the banking sector, traded on the stock exchanges in Sweden, Denmark, Croatia and Bulgaria

The parallel between the four studied sectors shows the highest market liquidity for shares of pharmaceutical companies, followed by banking. The other two sectors generally show lower market liquidity with a slight advantage of electric energy over oil companies.

6. CONCLUSION

Based on the conducted empirical study of the market liquidity of companies from the oil, electricity, pharmaceutical and banking sectors, traded on the stock exchanges in Stockholm, Copenhagen, Zagreb and Sofia, we can summarize the following practical conclusions: It was found that the share issues of companies from the four sectors traded on the two Scandinavian stock exchanges have very good market liquidity, with most of the Swedish ones showing,

albeit by a small margin, higher than the Danish ones. As expected, the market liquidity of shares from the two Balkan stock exchanges is significantly lower. Accordingly, Croatian companies from the oil, electricity and banking sectors show better market liquidity than Bulgarian companies. The parallel cut between the four sectors arranges the companies in the following sequence: pharmaceuticals, banks, electric power and finally petroleum. Despite the smaller differences between the two periods for each of the companies than the differences between the stock markets and the sectors, the general conclusion emerges that: in the last - military month (July 2022) market liquidity has decreased compared to that established for the pandemic December 2020. We find lower activity for the studied companies during the war in Ukraine, which also means increased market risk. The reasons for this can be both - of a general economic nature and the result of a change in the general stock market activity. As a result of the analyzes on the methodology of market liquidity measures, we synthesize the following more significant conclusions:

1) For the practical application and study of the models for market liquidity of share issues, it is essential to consider them from the point of view of the included indicators - price and/or natural.
2) Many of the measures of market liquidity lack sufficient popularity, and publications of a critical analytical nature on the applicability of particular measures are insufficient.
3) Due to the methodological specificity of the measures based solely on price indicators and the possible unobjectiveness resulting from this, we recommend the application together with combined models and more complex naturally-based ones.
4) The natural Complex CRML showed clearly comparable results for all studied companies in the theoretical range from 0 to 1. Unlike this model, the others lack a finite scale, which makes it difficult to be precise in interpreting the results.

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THE INTERNATIONALISATION OF BUSINESS EDUCATION AS A MUST: AN EXAMPLE FROM BULGARIA

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ABSTRACT
The internationalisation of higher education has become a key objective of every university worldwide due to socio-economic processes such as globalisation and the emergence of information and communication technologies. Previously, the international activity of the oldest and most prominent universities allowed them to attract the world's most distinguished professors and researchers. Thus, they provided their students with a highly recognised diploma and the best education. In modern times, the academic trend is to internationalise in order to survive, expand, improve the quality of education and research thus leading to enhanced intellectual and material capacity and adding value to society. This is of crucial importance for business universities due to the international nature of modern business and within the context of knowledge economy. The University of National and World Economy is the biggest economic university in South-Eastern Europe with programmes including all sectors of the economy. It aims to expand and internationalise by offering cutting-edge education and cooperating with local and foreign universities and organisations. This paper deals with the various facets of the process of academic internationalisation and focuses on the results of a survey on the sector of real estate and the education and training of its employees. Such surveys involving educational stakeholders are seen as a key way of providing insights into the successful implementation of an academic strategy for internationalisation. The survey was based on online interviews, statistical and factor analysis.
Keywords: *business education, internationalisation, internationalisation strategies*

1. INTRODUCTION
The need for internationalisation of higher education has been on the agenda since the dawn of the modern era. However, this process unfolded in full at the beginning of the 21st century. Historically, this is related to the collapse of the Soviet Union and the collapse of the former socialist system that marked the end of the Cold War. For more details on these processes, see Gaddis, (2005), Service (2015), Leffler (2008), etc. Until then, the world was bipolar and internationalisation processes took place in the two world centres simultaneously and without significant forms of contact between them. In the Eastern Bloc, centred on the Soviet Union, the internationalisation of higher education served the so-called socialist economic integration of the countries that were members of Comecon (The Council for Mutual Economic Assistance).

This process was to a very large extent ideologised and tied to the ideas of the Marxist political economy and the struggle against neo-colonialism (Hoogvelt, 2001). A great number of young people from Africa, Asia and Latin America obtained higher education in the former socialist countries. Although ideology is a constant feature of this historic period, in the opposing camp led by the USA, the processes were much more varied. The dominating ideas were those of free market and liberal democracy, but there were a number of phenomena specific to Western Europe as well. First of all, former colonial states such as Great Britain, France, Holland, Spain, Portugal, etc. maintained and enhanced their educational and cultural relations with their former colonies and other third world countries. Second, but not in importance, European economic integration began during this period. It should be emphasized that in this period it was Western European (Corbett, 2003). The review of the internationalisation of higher education gives a reason to consider the modern manifestations of this process as taking place in three main periods. The first one coincides with the Cold War. The second one includes the first decade of the 21 c. when the globalisation processes of the business are particularly intense. The third period covers the second decade of the 21 c. and continues to present day. Nowadays, along with the common globalisation processes, there are observed a number of processes of local character as well. This complicates the analysis of the process investigated. This paper aims to examine an aspect of the internationalisation of higher education in business that has not been thoroughly explored in literature so far. It is the need for universities to participate in the professional business training of international character. The research was conducted among business partners of the Department of Real Estate at the University of National and World Economy (UNWE) in the period July-August 2022.

2. INTERNATIONALISATION OF HIGHER EDUCATION: PERIODISATION AND CONTENT

In specialised literature, the internationalisation of higher education in general and in business education in particular have been studied and described, for instance by Maringe and Foskett (2010), Deppe et al. (2018), etc. The periodisation of this process, however, has not been the focus of attention. The one proposed above by the authors is convenient for the purpose. The problems of the internationalisation of higher education during the Cold War is predominantly a problem that historians and specialised research focus on. The period including the first decade of the 21 c. contains factors that are still relevant today. They are mostly related to the active processes of globalisation of business and societies in general. This stage naturally passes into the next one (the second and the beginning of the third decade of the 21st c.) which continues up to present day. During the stage considered, trends become more complicated. The deepening of globalisation leads to the reaction of national and social groups that consider themselves threatened by it. This is a natural result since every objective process has positive and negative aspects. Ultimately, many local phenomena stand out. It was pointed out that the integration in the European educational space is an important factor. However, there are other phenomena that are global in nature but locally manifest differently. Key among them is the emergence of the knowledge economy based on modern technologies. As a matter of fact, the concept of knowledge economy arose much earlier in time (Arthur, 1996). In the period under review, however, knowledge economy is not just a global trend affecting the internationalisation of education, but a powerful tool to resolve the contra-dictions accumulated up to now. Nowadays, it can be concluded that the concept of knowledge economy guides the numerous factors affecting the internationalisation of higher education. This affects the globalisation and internationalisation of business and overall public life and requires new strategies to be used for the internationalisation of business education (Amann and Stachowicz-Stanusch, 2020).

This paper examines an aspect of the internationalisation of the activity of business universities which is not popular in specialised literature. This aspect is professional education in the context of knowledge economy. Modern information and communication technologies transcend national borders and pose new challenges to the management of business, private and public organisations. Now, professional education is associated with high technologies and, therefore, it acquires an increasingly international character. This requires interaction between business and universities for the building of systems for a professional education of a new kind, which are suitable for performing tasks in an international environment.

3. EMPIRICAL RESEARCH AND RESULTS

When planning this research, it was taken into account that real estate business is very specific. On the one hand, it is of particularly local nature and looks like an island among global processes. On the other hand, however, through the connectivity of financial and investment flows, this business reacts to each global trend. This reaction is not immediate and sometimes time lags are observed. Besides, the relationship between the external global impact and the response of the local market is generally not direct but mediated. For instance, due to global stagnation, export is decreasing, some businesses are closing, incomes are going down, the share of disposable income for houses is falling and demand on the real estate market is decreasing as well. Since at a given moment supply on this market depends on the investment during the previous three-five years, supply and demand can differ considerably. This, in turn, activates price market mechanisms. The interaction described can occur in the reverse order, thus resulting in increased demand. Having in mind these peculiarities, respondents are not asked direct questions like "Do you expect your business to interationalise?". Instead, a segment of real estate business has been chosen that is a priori international in its essence. In our case, this is the so-called PropTech - - all the tech tools real estate experts use to optimise the way people buy, sell, research, market, and manage a property (Ascendix, 2022). The idea is to interpret the professionals' expectations regarding PropTech as implicit expectations of business internationalisation. Next, respondents' beliefs about how adequate universities are to deal with new challenges such as PropTech are explored. These beliefs can be interpreted as expectations about the universities' ability to successfully internationalise in the future. The respondents in the survey are 92 and have different professional experience, but they have all achieved good results as real estate agents. They were interviewed online and were informed that the survey results would be processed by the Department of Real Estate at UNWE, Sofia. The university is well known in the country and is perceived as a leader in the field of economics and business. In other words, the respondents participate consciously in the business-university relationship. In addition, this is the reason why the response rate is so high – over 93%, which is noteworthy. Initially, the respondents were divided into three groups depending on the years of experience in the sector – up to 3 years, between 3 and 7 years and over 7 years. As the data processing proved to make the interpretation of the results difficult, the respondents were regrouped into two groups – with experience of up to 3 and over 3 years of professional experience. Perhaps, the critical threshold for the accumulation of basic professional skills in this business is about three years, which is why the answers of the agents of the second group are largely similar. In the research planning, evidence of the existence of two main dependencies is sought. The first one is that as professional experience increases, so does the understanding of the need for professional training. The second one is that as professional experience increases, so does the degree of PropTech knowledge. On the basis of this and the results of the survey, the beliefs of the respondents regarding the guidelines for the internationalisation of business education in universities are analysed following the example of UNWE.

3.1. Relationship between professional experience and attitudes towards professional training

The examination of the correlation between professional experience and attitude to professional training is apt to be formulated as a hypothesis to be proven (Kohler, (2020). For this purpose the questions "How long is your professional experience?" and "To what extent do you agree with the statement that vocational training improves business performance?". The answers to the second question are given by using a five-point Likert scale. As noted above, professional experience is presented as two alternative groups– up to 3 (inclusive) and more than 3 years experience. The results are presented in the following four tables. Calculations were made by using the statistical analysis software package SPSS.

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Experience / Professional training matters for results	92	100,0%	0	0%	92	100,0%

Table 1: Case Processing Summury
(Source: Authors' own calculations)

			Professional training matters for results (PTM)					
			I strongly desagree	I do not agree	I have no opinion	I agree	I strongly agree	Total
Ex-peri-ence (Exp)	Up to 3 years	Count	7	17	9	5	0	38
		Exp. count	3,3	7,8	7,4	14,0	5,4	38,0
		% within Exp	18,4%	44,7%	23,7%	13,2%	0,0%	100,0%
		% within PTM	87,5%	89,5%	50,0%	14,7%	0,0%	100,0%
		% of Total	7,6%	18,5%	9,8%	5,4%	0,0%	41,3%
	More than 3 years	Count	1	2	9	29	13	54
		Exp. count	4,7	11,2	10,6	20,0	7,6	54,0
		% within Exp	1,9%	3,7%	16,7%	53,7%	24,1%	100,0%
		% within PTM	12,5%	10,5%	50,0%	85,3%	100,0%	58,7%
		% of Total	1,1%	2,2%	9,8%	31,5%	14,1%	58,7%
		Count	8	19	18	34	13	92
		Exp. count	8,0	19,0	18,0	34,0	13,0	92.0
		% within Exp	8,7%	20,7%	16,9%	37,0%	14,1%	100,0%
		% within PTM	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
		% of Total	8,7%	20,7%	16,9%	37,0%	14,1%	100,0%

Table 2:"Experience/ Professional training matters for results" Crosstabulation
(Source: Authors' own calculations)

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	44,857[a]	4	,000
Likelihood Ratio	52,579	4	,000
Linear-by-Linear Association	41,348	1	.000
N of Valid Cases	92		

Table 3: Chi-Square Tests
a. *2 cells (20.0%) have expected count less than 5. The minimum expected count is 3,30.*
(Source: Authors' own calculations)

		Value	Approx. Sig.
Nominal by Nominal	Phi	698	,000
	Cramer's V	698	,000
N of Valid Cases		92	

Table 4: Symmetric Measures
(Source: Authors' own calculations)

The data give reason to reject the null hypothesis (in the case that the indicated dependency is absent) and to accept the alternative one. It states that there is a relationship between the variables under consideration. According to Cramer's test, this relationship is medium in strength (Table 4). With regard to the reliability of the results, it should be noted that the Chi-square test has a level of significance that exceeds the standard requirements for $\alpha = 0,05$ many times (Table 3). The same applies to Cramer's test. The results of the calculations show that all conditions for the correct application of the Chi-square test are present (see the comment to Table 3). The percentage and frequency of the positive answers (Table 2) show that the respondents with longer professional experience are much more convinced of the benefits of professional training than their novice colleagues.

3.2. Relationship between professional experience and degree of knowledge about the concept of Proptech

The inferences about this relationship are based on the answers to the questions "How long is your professional experience?" and "Have you heard of PropTech before?". The possible answers to the second question are: "This is the first time I've heard about it.", "I know it, but I don't apply it." and "I use PropTech in my work.". Calculations were made by using the statistical analysis software package SPSS. The results are presented in tables 5 - 8.

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Experience / Degree of knowledge about Proptech	92	100,0%	0	0%	92	100,0%

Table 5: Case Processing Summary
(Source: Authors' own calculations)

			Degree of knowledge about Proptech (DKP)			
			This is the first time I've heard this	I know it, but I don't apply it	I use Proptech in my work	Total
Ex-peri-ence (Exp)	Up to 3 years	Count	18	16	4	38
		Expected count	14,0	16,1	7,8	38,0
		% within Exp	47,4%	42,1%	10,5%	100,0%
		% within DKP	52,9%	41,0%	21,1%	41,3%
		% of Total	16,9%	17,4%	4,3%	41,3%
	More than 3 years	Count	16	23	15	54
		Expected count	20,0	22,9	11,2	54,0
		% within Exp	29,6%	42,6%	27,8%	100,0%
		% within DKP	47,1%	59,0%	78,9%	58,7%
		% of Total	17,4%	25,0%	16,3%	58,7%
		Count	34	39	19	92
		Expected count	34,0	39.0	19,0	92,0
		% within Exp	37,0%	42,4%	20,7%	100,0%
		% within DKP	100,0%	100,0%	100,0%	100,0%
		% of Total	37,0%	42,4%	20,7%	100,0%

Table 6:"Experience/ Professional training matters for results" Crosstabulation
(Source: Authors' own calculations)

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5,115[a]	2	,078
Likelihood Ratio	5,367	2	,068
Linear-by-Linear Association	4,915	1	.027
N of Valid Cases	92		

Table 7: Chi-Square Tests
a. *0 cells (0.0%) have expected count less than 5. The minimum expected count is 7,85.*
(Source: Authors' own calculations)

		Value	Approx. Sig.
Nominal by Nominal	Phi	,236	,078
	Cramer's V	,236	,078
N of Valid Cases		92	

Table 8: Symmetric Measures
(Source: Authors' own calculations)

The results from the calculations are really interesting. All the necessary prerequisites for applying Chi-square analysis are present (see the comment to Table 7). The level of significance of the test is also within the norms for α = 0,05 (Table 7). At first glance, this requirement is not met because the level of significance is 0,078. However, taking into consideration that the critical region in Chi-square analysis is necessarily one-sided, this value must be recalculated by dividing it to two. In this situation, the credibility requirements are met (Ruland, 2020). In contrast, the situation with Cramer's test is different. First, the depth of the relationship is too weak – 0,236 at the maximum posiible valie of 1. Here, the level of significance of the results (0,078) does not meet the requirements. The available data do not provide sufficient grounds to categorically reject the null hypothesis and accept the alternative one. We accept that the studied dependency is not statistically proven. The reasons for this can be different. Most probably, young agents are familiar with PropTech, even though they have no direct experience with it. Young people are open to new technologies and show interest in them. Accordingly, more experienced agents often encounter the concept in their professional context. In conclusion, there are no significant differences between experienced and young real estate agents in terms of the level of knowledge about Proptech.

3.3. Factor Analysis
The results from the check of the above dependencies are not surprising. In general, they show that on some issues there is a clear statistically significant difference between the opinions of young and experienced real estate agents, while on other issues not. In the second case, both a coincidence of opinions and a stochastic dispersion of answers, which is not influenced by professional experience, are possible. It is to this case that the attitudes regarding PropTech refer. As noted above, these attitudes can be interpreted deeply as attitudes towards the objective necessity of business internationalisation. Using factor analysis of respondents' responses about PropTech, insights into the future of real estate business internationalisation can be drawn. Table 9 presents the calculations of the Cronbach's Alpha for the questions about PropTech.

Table following on the next page

Case Processing Summary		
Cases	N	%
Valid	92	100,0
Excluded	0	0.0
Total	92	100'0
Reliability Statistics		
Cronbach's Alfa	Cronbach's Alfa Based on Standardised Items	N of Items
,222	,274	8

Table 9: Reliability Statistics – Cronbach's Alfa
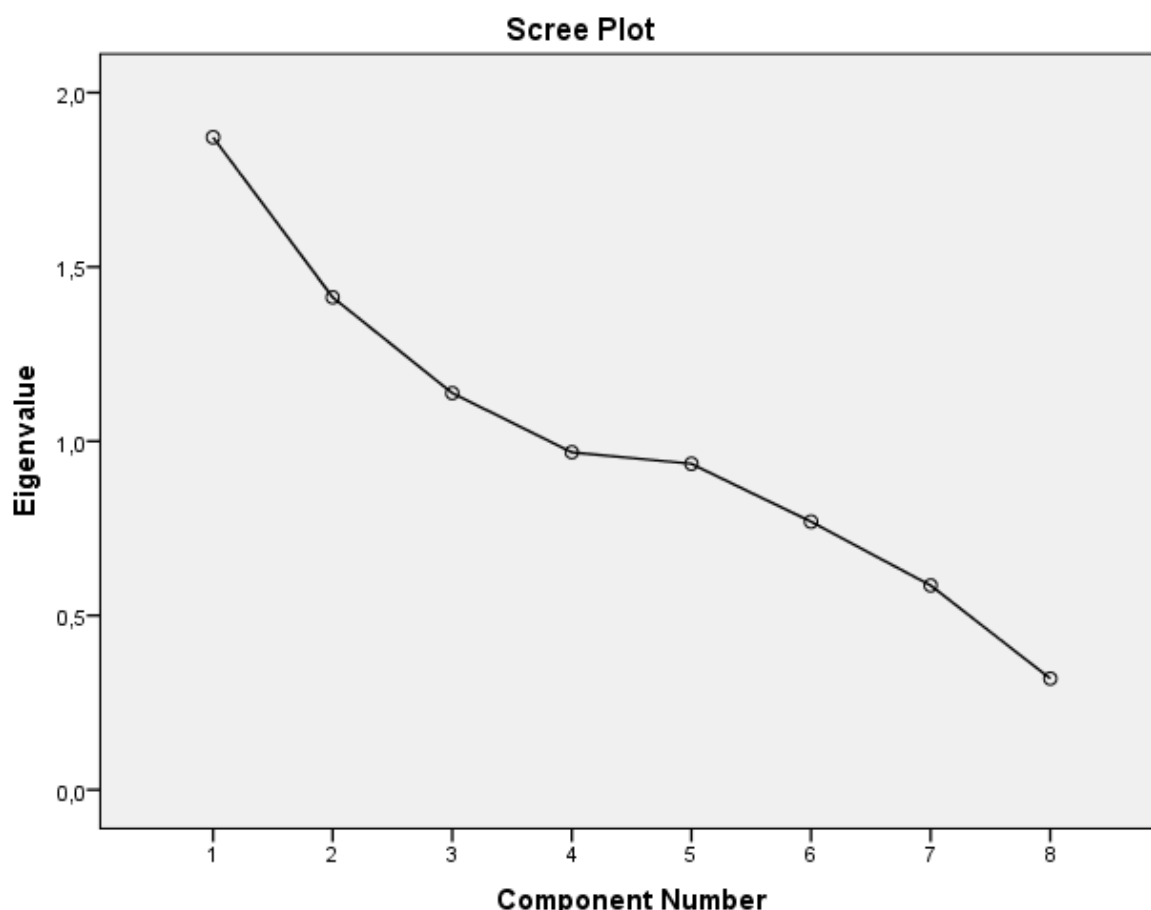*(Source: Authors' own calculations)*

The results reveal a very poor internal consistency of the measurement scale used. The most likely reason is the lack of common perceptions about the nature and characteristics of PropTech among the respondents. Nevertheless, the factor analysis procedure can be applied, but the results will have to be interpreted very carefully. In this case, the ideas, opinions and attitudes extracted from the answers of the respondents cannot be considered as categorically manifested. However, they are real and can be used as hypotheses with a relatively high probability of realisation. These hypotheses can be accepted or rejected after a proper testing procedure. Table 10 presents the results of the sampling adequacy calculations with the tests of Kaiser – Meyer – Olkin and Bartlett.

Kaiser – Meyer – Olkin Measure of Sampling Adequacy		,535
Bartlett's Test of Sphericity	Approx. Chi-Square	81,966
	df	28
	Sig.	,000

Table 10: KMO and Bartlett's Test of Sphericity
(Source: Authors' own calculations)

As should be expected, the sampling adequacy is poor. This means that all eight directly measurable traits (formulated as PropTech questions) are related to at least one latent factor. As mentioned, we can try to derive some of these factors with the proviso that we consider them as hypotheses. In the first stage, we apply free extraction of the factors based on the Eigenvalues setting the option for a graphical solution (Scree Plot). The visualisation is presented in Figure 1.

Figure following on the next page

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Figure 1: Number of factors – graphical solution
(Source: Authors' own calculations)

As the figure shows, there is no distinct transition from the steep to the sloping part of the graph based on which to determine the number of latent factors definitively. Some change in the slope of the curve is observed at the fourth point of the graph which gives us reason to assume that the components (latent factors) are four. Factor extraction procedure is applied once again, this time explicitly setting the number of factors – four. From the component matrix, those measurable features (statements) are found that have the highest loadings. They should lead to the formulation of the content of the latent factors. These are the following statements:
- Professional training is important for business results;
- PropTech will establish in Bulgaria later – after more than 5 years;
- PropTech will be implemented through universities;
- PropTech will establish in Bulgaria.

The statements are ordered in accordance to their load. The results should be interpreted very carefully. It must be taken into account that these are not direct conclusions, but gudelines for formulating concepts of an implicit nature. Some of them seem controversial, but only at first glance. On the one hand, PropTech is seen as something that will inevitably establish after a certain period of time. On the other hand, respondents are not yet convinced that this time has arrived. There is a belief that universities have an important role to play in the adoption of PropTech. Furthermore, the direct results of the survey show that according to real estate agents, professional training is better than university education in terms of applying PropTech in business. All these possible contradictions must be borne in mind when interpreting the results.

4. CONCLUSION

The final results of the study are divided into two groups. The first group includes proven claims that can be expanded and refined in further research. The second group of results are ideas, statements and opinions that we cannot accept as categorically confirmed by the collected empirical material. Nevertheless, there is evidence for them as well, but not conclusive. The findings from this group can be used as high-probability hypotheses. They are a good starting point for further research to accept or reject them. The first group of results refers to the relationship between the experience as a real estate agent and the belief that professional education is important for the final practical results. Experienced real estate agents share this belief unlike their younger colleagues. Furthermore, this group refers to the lack of a statistically significant relationship between professional experience and the degree of knowledge about PropTech. It is not difficult to find a logical explanation of this phenomenon. The simplest one is that experienced real estate agents have encountered PropTech and its local manifestations in their practice. Accordingly, their young colleagues are open to technological novelties and follow them. This is how they have come across PropTech in the context of information technologies and other modern trends such as FinTech. In spite of the insufficient statistical evidence, the findings of the second group are much more interesting. As the factor analysis shows, there are many hidden beliefs among real estate agents that have not yet clearly crystallized and are yet to be articulated further. First of all, according to the majority of the respondents, the real internationalisation of their business is yet to come. In this case, the attitude towards PropTech as an a priori international business serves as an indicator of expectations. On the one hand, the respondents are convinced that PropTech will establish through appropriate professional education. On the other hand, though, factor analysis reveals latent beliefs that the role of universities in this process is of particular importance. It can be summarised that, along with the traditional driving forces of higher education internationalisation, the research has identified another one. This is the need of business for professional training of an international character in which universities participate actively. In this direction, forms of interaction with the business should searched for.

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THE ROLE AND IMPORTANCE OF HUMAN RESORCES

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ABSTRACT
Managers and leaders in organizations must not neglect human resources, this extremely relevant and important segment, in order to avoid major planning, organizational and other problems. Human resources are a living factor in the structure of a company, who with their knowledge, skills, abilities, creativity, and innovation contribute the most to competitiveness and achievement of all the company's goals. Human resources are of the greatest value on Earth. They are the only factor in the success of a business that cannot be replicated, whose abilities, skills, and rich knowledge cannot be copied. People are the only business resource that can develop themselves and whose value does not decrease, but increase, with usage, which greatly distinguishes them from other resources, whose value is significantly reduced by wearing out. Their satisfaction is becoming the main power of competitiveness and advantage in an extremely unpredictable and demanding world market. Consequently, the concept of human resource management requires a paradigm shift regarding the content of work and the way personnel functions in a modern company are organized. Due to the complexity and relevance of human resources, it is necessary to divide them into several significant segments and try to explain their importance and ultimate purpose.
Keywords: human resources, business success, planning, motivation, rewarding

1. INTRODUCTION
Human resource potential represents the total knowledge, skills, abilities, creativity, and motivation of a person, or the total intellectual and psychological energy that a person is willing to give and invest in the development and achievement of goals. Human resource planning is also an integral part of human resource management. It is a conscious and organized activity, i.e. a process by which certain knowledge and values are perceived and anticipated. Special emphasis is placed on the role and importance of human resource planning, factors influencing human resource planning, various processes, and methods of human resource planning, strategies in case of multiple employees, strategies for resolving redundancies and organizational consequences. In the 21st century, words like capital, innovation, and value take on a completely different meaning, namely, these are people, their knowledge, skills, and other competencies. People and their development are becoming the main weapon of competitiveness and advantage in a highly dynamic and demanding world market. According to Gutić and Rudelj (2012: 43), people are by nature free, individual, social, and political beings. On the one hand, people are initiators of various activities that they have always undertaken through organizations, whether for survival, efficiency or profit, thus developing their intellect that managed to exceed their physical capabilities. On the other hand, when persons are born, they automatically begin their life as very weak beings, but with two invaluable qualities that give

them a certain competitive advantage over other living beings; namely, specific learning ability and an environment where this learning ability allows them to progress in a relationship with the world around them, and also motivates the struggle for survival. According to Zoretić, Čižmek Vujnović, and Radovanić (2020:89), the human need to preserve and transmit knowledge has existed since the birth of humanity. Human resources and human resource management are certainly the keywords and the main preoccupation of modern managers and various organizations, and these terms have become a significant topic of the scientific literature in the last 20 years or so. The subject of the research in this field are people, their work, and various factors that determine and direct their organizational behavior (Rupčić, Gaica; 2018:178).

2. THE IMPORTANCE OF HUMAN RESOURCES
Human resources as a common element of all organizations contribute to the overall success with their abilities and skills. "People have always been focused on organizations, which for them represent a certain tool, i.e. a tool for the realization of their needs, but people are also a specific component of these organizations." (Gutić, Rudelj; 2011:45). The further development and success of the company depends on the careful assessment and selection of candidates. Human resource management activities can, directly and indirectly, affect an organization's productivity (Jusufi, Ramaj; 2020:577). Directly, by finding better and more efficient ways to achieve goals, and indirectly by influencing the improvement of working abilities. The planning process itself is more prone to mechanical systems, while current business organizations are defined by the increasingly complex role of people, and people have a new role that is very dominant thanks to the information technology revolution. According to Keeley (2007:23), "in the global knowledge economy, the abilities, learning, talents, and characteristics of people - their human capital - have become crucial, both for their ability to earn and for wider economic growth."

2.1. The concept and purpose of planning
According to Jurina (2011:79) "The importance of planning cannot be emphasized enough because an objective analytical view of the organization and its future business reveals its strengths and weaknesses, identifies dangers and causes and finds opportunities to achieve goals." Planning is a process where one needs to decide which jobs are essential so they can be filled in an appropriate way. In this sense, absolutely all aspects that have a certain influence on decision-making processes should be precisely determined. It is necessary to cover all jobs, so it is of great importance to carefully select human resources in the organization from procurement clerks to top management, or the president of the board. "It is aimed at forecasting business tasks for a certain period, as well as the conditions for their realization, for the purpose of qualitative, quantitative, temporal and spatial harmonization and rationalization (Funda: 2011:163)." "It can be said that the result of planning is the process of setting goals and choosing the appropriate strategy for the implementation of these goals, which should be achieved in a certain period, and determining the criteria for controlling the results achieved (Horvat, Kovačić, 2004:114)." "Planning is just a more rational way to keep things going because it ensures that every, even smallest, operation or decision is a part of the broader framework in which development of the company happens. (Marušić: 2006:143). It should be pointed out that the so-called employment plan should be based on the strategic plans of the organization. In this context, plans to focus on new activities or to reduce costs have an impact on the types of jobs that will need to be filled or possibly vacated. The logical question that arises is whether to fill vacancies with human resources internally or externally, which generally requires different staffing plans. In case the vacancies are filled internally, certain plans for training, evaluation, and specialization should be developed, which is very demanding and requires

knowledge, resources, and some experience to be able to do so as to satisfy all stakeholders. On the other hand, external acquisition of human resources means planning the sources of candidates. As required by all quality plans, staffing plans must be based on certain forecasts or estimates. "In this case, these are staffing needs, the number of internal candidates, and the number of external candidates (Dessler: 2015: 178)." The purpose of human resource planning is to assess where the organization is currently standing, where it is going, and what the implications of these assessments are for future supply and human resource needs. Roughly, human resource planning can be defined as a process aimed at anticipating future business and environmental requirements of the organization and meeting the human resources needs that will be dictated by these conditions (Csugány, 2018: 534). It considers the number and profile of human resources needed to ensure the success of the organization's strategic plan. "Although the existence of a diversity of the workforce is widely recognized today in organizations around the world, it is too often discussed only in the context of respect for the law and the protection of human rights" (Cox Jr. T.; 2001: 4). Generally, human resource planning can be explained as the process by which a company ensures the right number and profile of people in the right place, at the right time, and people who are capable of performing certain tasks efficiently and successfully.

2.2. Benefits of planning

It is obvious that organizations that systematically plan their human resources as an integral part of business planning, in the long run, have many advantages. Their managers are convinced that human resource planning gives them a certain advantage in the market and makes their organization more flexible. Human resource planning leads to the effective and balanced use and development of human resources. It should be added that various analyses of human resource activities show that their success depends on the answers to the questions of how many people are needed and what profiles are needed with what knowledge and skills. "Plans determine what a company must do and how to do it the best possible way (Sikavica and Bahtijarević-Šiber, 2004: 75)." In organizations with a good human resource planning system, employees have greater opportunities to participate in their own career planning, training, and development. They are very likely to feel that their talents and abilities are important to the organization and that they are more likely to come to positions that will make better use of their talents. This, of course, leads to greater satisfaction, and motivation and generally has a very positive effect on work behavior where it reduces absenteeism, fluctuations, and various accidents at work. It also leads to a greater sense of care and an honest relationship. Most importantly, however, it makes it possible to avoid or reduce redundancies through retraining, training, and relocation. "Planning encourages and requires better management of human resources as a whole" (Bahtijarević Šiber; 1999: 188). When managers are required to provide human resource plans in addition to production plans, finance plans, etc., they are actually forced to better manage this most important organizational resource. Reducing the cost of human resources is an important effect of their planning. Labor costs make up a significant segment of the costs of modern businesses. Their irrational use increases costs, while high-quality planning as an integral part of human resource management reduces them and increases the overall profit of the organization, i.e. turns investment in human resources into development investment with extremely high rates of return. It protects the organizational investment in human resources and prevents the cost of demission. It is estimated that an organization's investment in a new employee with a bachelor's or master's degree is around $ 60,000, with a low probability that this person shall make a significant contribution in the first year of employment through their work activity. Losing such an expert after only one year and hiring a replacement in the next year are additional large and unnecessary costs.

3. PERFORMANCE MONITORING

Performance management can be defined as the process by which managers ensure that all activities and results of employees are in line with the goals of the organization and is crucial to achieving a certain competitive advantage. The performance management system through thorough job analysis shows which aspects of work are relevant to the organization. The most important step is to take responsibility for our actions and our lives because in that way we create our success (Bele 2018: 59). These aspects are measured by the so-called performance appraisal, which is just one method of measuring workers' performance. It should be said that it is necessary to give employees feedback in meetings so that they can adjust their work to the goals of the organization. "At the same time, it is very important to build and support the idea of who does what in business, who is responsible for determining how much an employee works and who is responsible for making the final decision if partners do not agree" (Škrtić, Mikić; 2011: 131). The link between performance management and organizational strategies is often overlooked. In order to achieve a competitive advantage, characteristics, behaviors, and outcomes must be linked to the organization's strategy. There are various criteria for monitoring and comparing performance, but the five most important ones should be singled out, namely: strategic matching, validity, reliability, acceptability, and specificity.

3.1. The role of the manager

Managers in organizations have great responsibilities and obligations. It is necessary to have the appropriate knowledge, experience, and skills to be able to do the job adequately. Also, one of the relevant skills is the assessment of work efficiency, which is a very difficult but necessary skill that managers must possess. This person must also carry out the assessment, and the manager who evaluates his or her employees too highly or too lowly does not do any service to either the workers or the organization. For this reason, managers need to be very well acquainted with various techniques in terms of assessment, they need to understand and try to avoid problems that can seriously cause damage and they must certainly know how to interpret information and conduct assessments fairly. Human resource managers generally offer assistance and advice on which assessment techniques to use, but the final decisions on procedures are left to the operational heads of departments. "It is extremely important to point out that employees are not in themselves human capital for the employer, but they become so when they transform their knowledge and skills into actions that contribute to creating value for the company" (Croatian Chamber of Commerce; 2004: 23). It is important to say that the human resource unit should also be responsible for training managers in order to improve their assessment skills, control the efficiency of the assessment system and ensure that the assessment system follows and respects equal employment opportunities. The full work efficiency and appropriate professional contribution of such experts requires a period of three to five years of organizational investment.

3.2. Motivating human resources

"Motivation is behavior directed towards achieving a goal that arouses needs in a person, and the reason for certain behavior is the satisfaction of these needs" (Jurina; 2011: 110). Every person is original in their own way and possesses certain qualities that others do not. In this sense, many questions are asked, such as why someone does exactly that, why the results of his or her work differ from the results of other employees with the same expertise and experience in the organization, why one type of incentive and stimulation works well on some people and less so on other employees, etc. All the answers to these questions lay in the motives and motivation of the employees. "Motivation of people, creating greater employee satisfaction, career development of employees and other activities are just an instrument of profit growth" (Gutić Martinčić 2017: 13).

Managers who think that the motives of their employees and associates do not deserve particular attention do not know the basic philosophy of human resource management and live in great ignorance, because without constant questioning and monitoring of the motives of everyone in the organization, there is no successful management. Motivation includes all internal factors that consolidate intellectual and physical energy, direct behavior and determine its direction, intensity and duration (Mijoč; 2019: 228).

3.3. Rewarding human resources

We identify rewarding with various forms of material benefits to employees and managers, which honors their effort, commitment and results achieved. Rewarding integrates and follows from other human resource management functions such as performance appraisal, people motivation, training, and development. Rewards and rewarding are among the basic motives, where money has great power in meeting human needs (Šandrk Nukić; 2017: 639).

When rewarding people, important activities are: setting standards and aligning incentives with the results of work, drafting proposals for employee incentives, drafting proposals for benefits, and analysis of the reward system (Načinović Braje; 2021: 555).

4. RESEARCH METHODOLOGY

The empirical part of the paper is based on conducting primary research using a survey as the most commonly used method of collecting data and information in social research as well as the in-depth interview method (Benšić, Šuvak, 2013: 15). The survey was conducted during May and June 2021, online via Google Forms. The purpose of this research is to collect respondents' thoughts on the importance of the role of human resources. The survey questionnaire was divided into three parts. The first part contains basic data on respondents, such as gender, age, education, length of service, and their current situation. The second part contains the results regarding human resources, with an emphasis on relevance, competitiveness, skills, salaries, etc. In the last part, there are answers related to the importance and role of human resources in the organization, with the aim of this paper to understand the current perception of citizens and their awareness of human resources in order to obtain an appropriate answer on what needs to be done in order to make the situation related to human resources better in the future in all aspects.

4.1. Research results

A total of 114 respondents participated in the study, of which 57.9% were female, while 42.1% were male. Most respondents or 41.7% are between 21-30 years old. They are followed by 27.8% of respondents between the ages of 41-60 and 20.9% of respondents between the ages of 31-40. As expected, the least number of respondents is over 60 years of age, i.e. 5.2%, and finally 4.3% of respondents are under 20 years of age. Most respondents or 43.5% have a high school diploma, followed by 25.2% of respondents who completed graduate studies. The next group with 23.5% are respondents who completed undergraduate studies. Furthermore, there are 4.3% of respondents with master of science, 1.7% of respondents with a doctorate, 0.9% of respondents with only primary education, and 0.9% of respondents with a postgraduate university degree. The highest number of respondents or 43% have 7-30 years of work experience. Next are the respondents with 2-6 years of experience with 31.6%. 14% of respondents have less than 2 years of work experience, while 11.4% have more than 30 years of work experience. The research involved respondents with different life and work experience, which significantly contributed to this survey.

4.2. The importance of human resources in the organization
79.8% of respondents pointed out that human resources are very important for any organization. 19.3% of respondents said that human resources are important for the company, 0.9% of respondents think that people are not important for organizations at all. No one answered that they did not know, which means that respondents are quite aware of the relevance of human resources for the work and well-being of each company. 49.6% of respondents believe that ability is the most important characteristic of high-quality human resources. This is followed by knowledge voted for by 20% of respondents, while 17.4% opted for experience, and only 13% selected the skill. Respondents think that ability is more important than knowledge. According to 80% of respondents, the key factor for the success of a company are human resources. 10.4% believe that technology is the key factor for the success of a company, followed by 8.7% of respondents who believe that money is the deciding factor that makes a difference, while 0.9% of people think that location is the most important factor that makes the difference between a successful and unsuccessful company. 50.4% of respondents believe that they should have salaries between 8,000-9,000 kunas. 28.7% of respondents believe that they should have 10,000 kunas or more considering the living standard, the economy, or the job they do. 20% of respondents think that it would be acceptable to have a salary between 6,000-7,000 kunas, while only 0.9% of respondents believe that a salary between 4,000-5,000 kunas is enough. It is obvious that the respondents are not satisfied with their current income and send a clear message about how much that income should be in order to be able to meet all the needs and financial obligations of respondents. 58.3% of respondents believe that persons must learn all their life, i.e. that they must stay informed, learn a lot and never stop improving in order to keep up with the times. 40% of respondents believe that people should be constantly trained in the narrow sense, i.e. in terms of their job. 1.7% of respondents believe that people don't need to be constantly educated and that the knowledge they have is sufficient. When asked which trait is most important in human resources, 60.9% of respondents answered that it is the responsibility, 19.1% believe that it is business ethics. 15.7% of respondents believe that it is devotion, while 4.3% of respondents answered that it is loyalty. It is obvious that most people think that responsibility is the most important characteristic.

4.3. Motivation and rewarding of human resources
The following data show what respondents think is the appropriate incentive for achieving good human resource results. As many as 67% of respondents believe that money is a reward that should be given to achieve appropriate results. Furthermore, 17.4% of respondents believe that the best reward is to get something of one's choice. 13% of respondents think that it is best to give more days off so that workers can use it in the way they want. 2.6% of respondents think that it is best to give certain gifts as a sign of gratitude and a reward for good results. The strongest motivator of human resources is money according to 51.3% of respondents. 40.9% believe that it is a promotion up the ranks of a company. 5.2% of respondents said "something else" motivates people, while reputation was at the last place with 2.6%. The basic factor in the human resource planning process is an adequate solution, according to 44.3% of respondents, while 27.8% of respondents believe that it is expertise, and 18.3% of respondents believe that it is comprehensiveness. 9.6% of respondents believe that objectivity is a key element in the human resource planning process. When asked what is the main role of a manager, as many as 90.4% of respondents believe that they must have knowledge and expertise and always be available and help everyone. Only 9.6% of respondents believe that a manager must be reasonable. 87.8% of respondents believe that the measure of employee motivation is the achieved results, while 6.1% of respondents believe that motivation should be measured by monthly salary.

When asked how to increase employee motivation, 64.3% of respondents would give a higher salary and thus increase employee motivation. 28.7% of respondents would give a reward and thus try to increase motivation. 5.2% of respondents would opt for more days off as a type of incentive for employee motivation. 1.7% of respondents believe that the best solution is to give fewer obligations and responsibilities and thus try to raise the motivation of human resources. As many as 93.9% of respondents believe that the best way to reward workers according to their achievements is by giving them performance-related pay, while 4.3% of respondents said it is best to give more days off, and 1.7% of respondents said it is best to give gifts. 45.2% of respondents believe that better communication is needed in order to improve working relations in the organization, while 41.7% chose the "all of the above" option. 7.8% of respondents believe that this requires better adjustment to the working environment, while 5.2% of respondents believe that it is a better financial performance. Since the following hypotheses are set:

- H1: The success of any organization depends mostly on the quality of its human resources.
- H2: Human resources are quite irrelevant and any organization can do without them.

The conducted research confirms the first hypothesis H1, while the second hypothesis H2 is rejected.

5. CONCLUSION
Every organization should understand the importance of human resources, especially in the 21st century when the emphasis is much on technique, technology, and digitalization; however, the most important are high-performing people. It is very important that organizations implement careful planning and forecasting of the number of employees, so they have different solutions prepared for the organization to function normally. The analysis and creation of jobs are also important because the organization must have solutions on how and in what way to select the best candidates, with which methods, methodologies, etc. Of course, every serious and modern organization must have a performance monitoring system, that is, ways to monitor their employees, their career path, development and progress, and based on that to create adequate solutions. The motivation of human resources is certainly an element without which workers cannot function normally and it is very important that they have a certain motive in order to be able to continuously grow and develop. Every organization must have a system in place to reward human resources so as to show respect for the work, effort, and energy that workers invest in their work on a daily basis. The working atmosphere in the organization must also be at the appropriate level. Highly-performing human resources want to achieve a rich career, so the organization must have a plan and program to help such workers fulfill their goals. Hypothesis 1 has been confirmed - the success of any organization depends mostly on the quality of human resources, so this segment should not be neglected. Hypothesis 1 confirms that respondents are aware of the importance of human resources and know that they require continuous investment in order to achieve a competitive advantage in the market. People are the foundation of every organization and everything must be provided to them so that they can achieve good performance on a daily basis and produce high-quality and noticeable results in the long run.

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IMPACT OF INCOME INEQUALITY ON ECONOMIC GROWTH IN THE EUROPEAN UNION IN THE PERIOD 2010-2021

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ABSTRACT

The goal of the present study is to test relationship between income inequality and the degree of economic growth in the European Union in the last decade. The main research question is whether there is an interdependence between income inequality and economic growth, and more specifically, whether income inequality is a determinant of the rate of economic growth in the European Union in the period 2010 - 2021. The research hypothesis is that in the period 2010 – 2021, income inequality in the EU had a unfavourable impact on economic growth in the Union. The empirical study is conducted through a panel econometric methods, based on a model, including several indicators.The data used are from Eurostat, the EU-SILC and ECHP surveys. The time limit of the study covers the period from 2010 – 2021, due to lack of data for all member states for the years before 2010). The results show that the level of inequalities correlate negatively with the level of economic growth, and the greater they are, the lower is the level of GDP. The results fit into the debate on the topic, as the problem of inequalities in the EU has been significant in recent years. A proper economic policy that addresses the tools to combat inequalities not only leads to greater social justice, but also to better economic efficiency.
Keywords: Income inequality, economic growth, GDP, European Union

1. INTRODUCTION

The review of scientific literature shows there are studies of both: the impact of economic growth on inequalities and the impact of inequalities on economic growth, with different outputs. Different studies of the impact of income inequality on economic growth show mixed and even contradictory results. The interdependence between income inequality and economic growth has been the subject of research for decades. Kuznets (1955) explored how income inequality affects economic growth, with the main factor he believed to be the process of industrialization. Based on data for three developed countries (the United States, the United Kingdom, and Germany), he traced the process through two periods. In the first period, inequality deepened as a result of fewer workers moving from the poor agricultural sector to the industrial sector. In the second period, however, as their numbers increased and the population employed in agriculture declined, income inequality decreased. Some argue that income inequality should be seen as a driver of economic growth. This can be assumed in several directions: through impact on investment and human capital or through fiscal policy. De Janvry and Sadoulet (2016) believe that income inequality can be positive for economic growth if rich people save more of their income and have the opportunity to invest their savings, leading to growth in the economy. This can be considered true especially if investment costs are high or large capital is required. Aghion, Caroli and Garcia-Penalosa (1999) suggest that a higher concentration of income and capital can generate a higher volume of investment, especially in an economy where access to credit is limited.

The uneven distribution of income can also be a favorable factor for economic growth through its impact on human capital. Galor and Tsiddon (1997) suggest that if wealthier social groups invest in human capital, the returns on these investments are likely to stimulate economic growth, generating additional positive effects in the long run. Inequality can also affect the growth rate through fiscal policy. Perotti (1996) takes this perspective by considering the condition of the median voter and suggests that a high level of inequality will indicate that he is relatively poorer compared to the average voter. For this reason, the median voter would support redistributive government policies, which are hypothesized to reduce growth due to market distortions (Perotti, 1996; Neves & Silva, 2014). Therefore, the growth rate would be higher in economies where the level of inequality is relatively low (Aghion, Caroli & Garcia-Penalosa, 1999). However, wealthier people have political influence as a consequence of their wealth, therefore support and implementation of redistributive policies would be lower in societies where wealth is unevenly distributed (Bénabou, 2000). In addition, redistributive policies do not necessarily lead to lower growth rates, for example, if taxes finance government spending on education, because this would increase the level of human capital and, in turn, the growth rate of the economy (Saint- Paul & Verdier, 1993). According to some economists, there is a threshold up to which inequality is satisfactory, but when it is exceeded it becomes harmful, so it is necessary to find an "optimal" level of inequality. Freeman (2012) states that once this threshold is crossed, economic growth declines with rising inequality. Inequality in this case will only be motivating for a very small number of people of a certain category who will participate in the generation of economic growth. If a certain level of income inequality can be shown to have a positive effect on economic growth, it would be possible for the government to influence income inequality (at least to some extent) and thereby achieve a higher economic growth. The question remains to what extent income inequality is positive and at what point it becomes a motivating factor for the population. If income inequality is too high, it certainly has a negative or demotivating effect on people's productivity, leading to subsequent lower economic growth of the country. Shin (2012) examines the relationship between inequality and economic growth through a stochastic optimal growth model and concludes that both are possible - higher inequality may slow growth in the early stage of economic development, but it may also promote growth in a near-steady state of the economy. It also finds that income redistribution through a high income tax does not always reduce income inequality. Income inequality can be reduced by higher income tax in a near-steady state of the economy, but it cannot be reduced in the early stage of economic development. In conclusion, he argues that two government policies – rapid economic growth and low income inequality – can be achieved through low income taxes in the early stage of economic development, but both cannot be achieved simultaneously in a quasi-steady state of the economy. On the other hand, a number of studies done at the global and regional level confirm that inequality has a negative impact on economic growth. The OECD proves that reducing income inequality would stimulate economic growth, and vice versa – the economies of countries where income inequality decreases grow faster (Cingano, 2014). According to the OECD, the biggest impact on growth is the widening gap between lower middle class and poor households compared to the rest of society. The impact of inequality on growth stems from the gap between the bottom 40 percent and the rest of society, not just the poorest 10 percent. The OECD's cross-country analysis, including many in the EU, provides evidence that the main mechanism by which inequality affects growth is by undermining educational opportunities for children from poor socio-economic backgrounds, reducing social mobility and hindering development of skills (Cingano, 2014). Mo (2003) concludes that income inequality has a significant negative effect on the GDP growth rate, with the direct impact of income inequality on the productivity growth rate accounting for more than 55 percent of the total aggregate effect.

A country-by-country approach is applied by Fawaz et al (2014), who examine only developing economies (classified as high-income and low-income developing countries - HIDC and LIDC, according to the World Bank classification) and find strong evidence of a negative interdependence between income inequality and economic growth in low-income developing countries (LIDCs), which are in stark contrast to a positive inequality-growth interdependence in high-income developing countries (HIDCs). Tian (2012) explores the correlation between income inequality and economic growth in China using a regression model and suggests that income inequality has a negative impact on economic growth rate in the case of Chinese economic conditions. Thomas Piketty is among the contemporary scholars of inequality, especially income inequality in 18th-century Europe and the United States. His main finding is that inequality is not an accident, but rather a feature of capitalism that can only be changed through government intervention (Piketty, 2013). The position of the European Commission is that when inequality becomes too large, it can threaten growth. This is especially true when it is driven by increased poverty at the bottom of the income distribution, where individuals lack the resources to invest in their skills and education and may be unable to reach their full potential, which is harmful for overall growth (European Commission, 2017). There are several ways, discussed below, in which income inequality has a negative impact on economic growth – by increasing social and political instability that leads to lower investment, by reducing the government budget as a result of social payments to overcome inequality, by reducing the opportunities of the poorer to continue their education, etc. Income inequality has been empirically proven to have a negative impact on social and political stability. Similar studies were done by Perotti, Venieris and Gupta, Keefer and Knack. Perotti (1996) suggests that inequality leads to a higher level of socio-political instability among both people and state institutions. This has a negative impact on the conditions for investment and other growth-stimulating activities. Therefore, a higher level of inequality has a negative impact on growth rates. Alesina and Perotti (1996) use an index of social instability that includes a larger set of variables and suggest that inequality leads to greater socio-political instability, which in turn negatively affects the level of investment. Venieris and Gupta (1986) examine the effect of socio-political instability on the amount of savings. The authors find that social and political instability, expressed through demonstrations, regimes and deaths resulting from socio-political uncertainty, leads to a reduction in savings. Keefer and Knack (2002) argue that when a society is polarized in terms of income inequality, it negatively affects the functioning of the government and the implementation of its policies. The authors argue that the greater the instability in society, the less stable the government and its administration. These effects ultimately reduce the rate of growth in the economy as well. In addition to this, income inequality negatively affects the economy also due to the fact that the government budget has to be spent to balance the income levels of people in financial difficulties. Inequality thus leads to a reduction in public resources for potential investment, which in turn reduces the country's growth potential (Seetharaman and Kan, 2018). Income inequality also affects economic growth through the credit market, and the observed impact is negative. The increasing level of income inequality reduces the means of poor people as well as their opportunities to obtain higher education (Albig et al., 2017; Hartmann et al., 2017; Stiglitz, 2016; Figini, 1999). Research in the scientific literature clearly shows that the higher the level of education a person has, the more likely he is to be employed in a high-paying job (Guvenen et al., 2014). When income inequality is high, low-income people who want to get a higher education have limited opportunities to get credit with which to finance it because credit markets are imperfect and their chances of borrowing the necessary funds are lower. small. As a result, people with lower incomes find it more difficult to access higher education. In this way, income inequality increases, the level of education decreases on a macroeconomic scale, that is, the accumulated human capital decreases, and this slows down economic growth (Castells-Quintana, Royuela,

2014; Susanu, 2012; Panizza, 1999). Increasing levels of education can stimulate technological progress and economic growth (Stiglitz, 2016; Galor, Moav, 2002). But increasing income inequality increases the number of people who cannot get a higher education, that is, it reduces human capital, which in turn slows down economic growth. This is one reason for the inverse relationship between income inequality and economic growth. The purpose of the present study is to test empirically the possible interdependence between income inequality and the degree of economic growth in the European Union in the last decade. The main research question is whether there is an interdependence between income inequality and economic growth, and more specifically, whether income inequality is a determinant of the rate of economic growth in the European Union in the period 2010 - 2021. It is important to examine this issue because of the strong influence of income inequality on poverty levels, education levels and migration, which have important socio-economic implications at both national and supranational levels. Research focusing on income inequality contributes to its deeper understanding, as well as to the assessment of its potential social and economic consequences, and also gives an insight whether income inequality is a factor that has boosted or constrained the rate of economic growth in the EU in the research period.

2. METHODOLOGY

The Gini coefficient and the S80/S20 indicator were chosen as indicators of income inequality. Both indicators show the degree of inequality, but the Gini coefficient takes into account the full size of the population, while the S80/S20 coefficient covers only the richest 20% and the poorest 20% of people. Both indicators, derived from the Eurostat database for the period 2010–2021, are based on the EU Statistics Survey on Income and Living Conditions (EU-SILC). The growth in gross domestic product (GDP) at market prices, as a percentage change over the previous year, is used to express economic growth. The data for the 27 countries of the European Union in the period 2010 – 2021 were retrieved from the Eurostat database. In the research period 2010 – 2021 the Gini coefficient for the EU was around 30. The highest income disparities among the EU member states with a Gini coefficient of over 35 were recorded in Bulgaria (40), Lithuania and Latvia (over 35), while income was more evenly distributed in Czechia, Slovenia, and Slovakia (Gini coefficient was less than 25), (Eurostat, 2022a). Income inequality is measured by the income quintile share ratio, which compares the income received by the top quintile to that received by the bottom quintile of the population. In 2021, the income quintile share ratio for the EU was arund 5, showing that, on average, the income received by the 20 % of the population with the highest income was five times as high as the income received by the 20 % of the population with the lowest income (Eurostat, 2022b). The high value for this ratio reveal considerable disparities in the distribution of income between the upper and lower income groups. The real GDP growth rate in the EU in the period 2010 – 2021 was rather unstable and fluctuated between negative values (- 0,7 in 2012 and the biggest fall of – 5,9 % in 2020 due to the Covid-19 pandemic) to around 2 % during the rest of the period (with record high of +5,4 % in 2021 as a result of post-pademic recovery), (Eurostat, 2022c). Before constructing a model and conducting the research, it is necessary to check for stationarity of the collected data. Stationarity refers to statistical series that do not depend on the time at which they are measured. If the data are not stationary, they are difficult to model because they may overestimate the true relationship between the variables or the significance of the coefficients. Therefore, they must either be brought to a stationary form by suitable transformations (which, however, usually lead to loss of information), or it must be shown that they are cointegrated (Robert, Engle, Granger, 1987). The test for stationarity in the present study was done applying the Dickey-Fuller test. The results show the presence of stationarity in all data, which allows to go further.

A verification procedure was carried out for the optimal number of lags of the indicators that measure income inequality and these are included in the econometric model. The theoretical literature suggests the existence of such lags, which necessitates a preliminary check before proceeding to the construction of the model and its evaluation. This is done in order to reveal the interdependence between the income inequality and GDP growth in a narrower sense, because both theory and empirical literature show that lag elements are present. The optimal number of lags that can be included in the present research is two, applied to the indicator of the quintile ratio of income between the Europeans with the 20 % of the highest and 20 % of the lowest income (using the SBIC, AIC and HQIC criteria). For the Gini coefficient, a preliminary check showed that there was no need to include lag elements. Based on the stationarity tests and the procedures for the optimal number of lags, the following model is defined, on which the empirical research will be carried out:

$$(1) \ \Delta EG_{it} = f_i + f_t + \beta_o \Delta GINI_{it} + \beta_1 \Delta SILC_{it-1} + \beta_2 \Delta SILC_{it-2} + \Delta \varepsilon_{it}$$

where:
ΔEG_{it} – the change in economic growth in period - "t" and in country "i";
f_i – country level fixed effects;
f_t – time level fixed effects
$\Delta GINI_{it}$ – the change in the Gini coefficient in period "t" and in term "i"
$\Delta SILC_{it-1}$ – the change in the difference between the income of the 20 % of people with the highest and the 20 % of the people with the lowest income in period "t", "t-1" and "t-2" and in country i
$\Delta \varepsilon_{it}$ – standard error

In essence, this model estimates the impact of income inequality, measured by two of the most commonly used indicators for their assessment, on the change in economic growth within the EU member states in the period 2010 - 2021. It is applying fixed effects at country level and time effects.

3. RESULTS
Table 1 presents the results of simple linear regressions performed using a panel NNMC. The results illustrate the impact of inequalities on economic growth in EU countries in the period 2010 – 2021. The results are constructed in four columns, where they are presented through several options: Column 1 - panel least squares method (PLSM), Column 2 - pNMMC with country-level fixed effects included, Column - 3 pNMMC with country-level fixed effects and time fixed effects included and Column 4 - pNMMC with time fixed effects, country-level fixed effects and country-level standard deviation clustering included.

Table following on the next page

	EU27 (1) Δ growth	EU27 (2) Δ growth	EU27 (3) Δ growth	EU27 (4) Δ growth
ΔGini	-0.424 (0.529)	-0.401 (0.573)	-0.159* (0.345)	-0.159* (0.303)
ΔS80/S20	2.279 (1.391)	2.589 (1.565)	0.501 (0.954)	0.501 (0.776)
ΔS80/S20(t-1)	-1.734 (1.612)	-1.625 (1.714)	-0.096* (1.027)	-0.096* (0.917)
ΔS80/S20(t-2)	-0.355 (0.791)	-0.196* (0.934)	-0.036** (0.571)	-0.036** (0.510)
N	260	260	260	260
R-sq	0.02	0.02	0.67	0.67
Levels of statistical significance: * p<0.05, ** p<0.01, *** p<0.001				

Table 1: Impact of income inequaliy on economic growth in the EU27 in the period 2010-2021 (linear regression – panel Least Squares method with fixed time and country-level effects1)
(Source: Authors' calculations)

The results of Table 1 lead to several conclusions:
1) First of all, the impact of income inequality measured by the Gini coefficient and SILC-S80/S20 is in the opposite direction. This means that the growth of income inequality in the EU27 in the period 2010 – 2021 has lead to lower economic growth values. This result generally confirms the similar theoretical assumptions on the subject, as well as a number of empirical studies in recent years.
2) Second, the interdependence between income inequality and economic growth is not symmetrical. For example, a 1% change in the Gini coefficient in the upward direction leads to a 0.15% lower economic growth with a statistically significant interdependence /Columns 3 and 4/. If we take the Bulgarian economy, for example, it would mean a GDP of less BGN 225 million at current prices for the relevant year in the conditions of an increase in the Gini coefficient.
3) On third place, a 1% change in the difference between the income of the 20 percent of the Europeans with the higest and the 20 percent of the Europeans with the lowest income leads to an economic growth, which is approximately 0.1% lower (with one-year lag and a statistically significant interdependence). In a two-year lag period, the interdependence is again statistically significant, but the negative effect on growth is significantly weaker. In the studied period, (2010 – 2021) there is no statistically significant interdependence between the two indicators, which gives an additional evidence of the need to include lag effects in this indicator;
4) It is clearly seen that with the inclusion of fixed effects, the explanatory power increases significantly from 2% in Column 1 and Column 2, to 67% in Column 3 and 4. This means that there are many other variables that can explain the variation of economic growth, but isolating them with the inclusion of time fixed effects, there is a significant negative and statistically significant interdependence between income inequality and economic growth in the EU in the period 2010 - 2021. After all, even if 2% of the variation in economic growth is a result of the change in income inequalitiy in a particular country, this is an important implication, which can serve as a benchmark for formulating a specific economic policy to limit income and wealth inequality.

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1 Legend: Δgrowth - change in economic growth; EU27 - all EU member states; ΔGini - change in the Gini coefficient ; ΔS80/S20 - change in the difference between the income of the 20 percent of the people with the highest income and the 20 percentage of the people with the lowest income; N – number of observations ; R-sq – explanatory power of the results.

Overall, the empirical research shows a negative interdependence between income inequality and economic growth in the EU in the period 2010 - 2021, i.e. the higher the income inequality, the lower the EU countries' economic growth.

4. DISCUSSION

Based on the empirical analysis, the hypothesis that income inequality is an unfavorable factor affecting economic growth in the EU was confirmed. In 2010 – 2021 the relatively stable income inequality in the European Union has negatively affected its overall GDP performance. As a result, ways of reducing income inequality in the EU member states should be further discussed. According to the OECD, the key to overcoming global inequality lies in investment in education, as the lack of investment in it by poorer social groups is the main factor behind inequality. Countries that promote equal opportunities for all from an early age are those that will grow economically and prosper. Anti-poverty programs will not be enough. Cash transfers and increasing access to public services, such as high-quality education, training and health care, are an essential social investment to create equality of opportunity in the long term. Addressing high and growing inequality is critical to promoting strong and sustainable growth and should be at the center of policy debate (Cingano, 2014). In addition, the OECD finds no evidence that redistributive policies, such as taxes and welfare, harm economic growth, provided these policies are well designed, targeted and implemented (Cingano, 2014). Studies suggest different approaches to tackling income inequality in the EU. Some of them point out that the opportunity to eliminate income inequality in the EU lies in redistributive measures, especially at the inter-state level, through development aid. In practice, however, countries should first address the problem of income inequality in their own countries before thinking about reducing inequality at the Union level. First of all, the growing social and economic disparities at the national level must be reduced, which can be done through higher taxes on capital, financial services and on the highest income groups (Carlén (2017). The second important point is to support educational opportunities for all citizens in one society. Carlén (2017) also considers the strengthening of the influence and responsibility of social partners to be a key solution, as well as the implementaion of a global agreement for equality and inclusive growth. Some researchers suggest that the problem of global inequality can be addressed through equal rights for women and their more active participation in the labor market. Due to the fact that about 60% of poor people are women, and only half of them are active workers, if developing countries included women more actively in the labor force, this would lead to income generation and subsequent consumption, which would also have a positive impact on the country's economic growth (Marion, 2015). This is why among the key objectives of the Gender Equality Strategy 2020 – 2025 of the European Commission are the closing the gender gaps in the labour market, achieving equal participation across different sectors of the economy and addressing the gender pay and pension gaps in the EU. Investment in education and skills is a key policy tool for reducing inequality, especially in the conditions of digital transition when technologies are the main driver of change in the working rquirements and the labour market. Another key policy for addressing income inequality is the tax and benefit system, as well as the redistribution system, which are different and have different effects in the EU members states. In addition, the provision of quality social services, such as high quality and accessible childcare, social housing, education and healthcare can also reduce income inequality and are also enabling greater female participation in the labour market, which can help reduce gender inequality. Where there is a spatial dimension to inequality, including a significant divide between rural and urban areas (f.e. as in Romania and Bulgaria), investment in transport and digital accessibility can also play an important role (European Commission, 2017).

5. CONCLUSION

It can be concluded that income inequality in the EU in the period 2010 - 2021 has been a factor affecting negatively the level of GDP on EU level. The results of the present research show that the differences in the degree of social inequality, in this case income inequality, have an unfavourable impact on the economic performance of the EU member states. This result can also be seen as part of the wider debate on the need for measures to promote not only the general decrease in income inequaility in the EU but also to enhance the real income convergence between the individual member states as well. It should not be forgotten, however, that preventing and reducing inequality largely depends on member states' actions and reforms.

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DIGITALISATION IN HUMAN RESOURCE MANAGEMENT: EVIDENCE FROM THE BULGARIAN BANKING AND INSURANCE SECTORS

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ABSTRACT
Digitalisation has gradually been changing the activities and processes of enterprises. This requires new managerial approach to improve their competitiveness or to keep their sustainability in today's highly dynamic and uncertain environment. It not only discovers new ways to reach bigger and distant markets, transforms the supply channels, optimises the processes and the costs, but also requires high investments for technological transformation, new managerial policies and strategies, including those related with human resources (HR). The successful digital transformation of companies requires also transformation of the human resource management (HRM) function, new competences of HR and new approaches to manage and retain people in the enterprise. Such transformation is even more important for the banks and insurance companies as the digitalisation of their activities is an inevitable step for achieving sustainable business results in highly competitive and highly regulated external environment, and the management of HR competencies is key to achieving of success. The aim of the paper is to analyze the degree of digital transformation in human resource management in Bulgarian banks and insurance enterprises, the influence of digitalisation on the HRM policies and practices and outline the main obstacles they face in this process. For this purpose empirical data is collected through a questionnaire sent to Bulgarian banks and insurance enterprises. The questions included in the questionnaire are focused on aspects such as management, HR planning, recruitment and selection, training and development, organisation of work, appraisal and compensation and communication.
Keywords: Human resources management, Digitalisation, Banking sector, Insurance sector

1. INTRODUCTION
The digitalisation in human resource management is a key feature of the technological revolution in Industry 4.0. This applies particularly to the financial services sector, where modern information technology has sharply reduced the need for direct contact of customers and bank and insurance staff. Digitalisation itself is mostly associated with an increase in the efficiency of employee performance in financial enterprises, measured by indicators of Net income per employee (NIPE), resp. Sales-per-Employee Ratio (Terziev, Zahariev, Pavlov, Petkov, & Kostov, 2021b).

In parallel with the increase in work efficiency through digitalisation, there is an ongoing process of digitalisation in HR management itself (Zahariev A. , 2012). Human resource management in financial enterprises is a specific process due to the high degree of responsibility of individual employees in conditions of compliance with "bank secrecy" and numerous anti money laundering measures (Belev, Schneider, Djankov, Zahariev, & others, 2003). That is why each stage of HR management in financial enterprises has its own digitalisation framework, which is a function of the internal information system, written internal rules for managing processes and paperwork, as well as applicable sectoral regulations at the level of national supervision and *aqui communitare*. Based on the above, the paper aims to analyse the degree of digital transformation in human resource management in Bulgarian banks and insurance enterprises, the influence of digitalisation on the HRM policies and practices and to outline the main obstacles they face in this process. It is structured in four main parts. After introduction, the second part is focused on literature review on the digitalisation in HRM in general and HRM in financial institutions. The third part presents the methodology and main results from a survey among Bulgarian banks and general insurance companies. The final part summarises the major findings of the survey.

2. LITERATURE REVIEW
2.1. Digitalisation in HRM
In the last two decades digital technology has reinvented and redesigned the role and the functions of HRM. Today, HR "is being pushed to take on a larger role in helping organisations *be* digital, not just *do* digital" (Occean, Stephan, & Walsh, 2021) by redesigning talent practices, experimenting with digital apps, and building a compelling employee experience. Digital technologies are used in various HR processes from recruitment (Zahariev & Zaharieva, 2003) to employee retention and core process automation. Recruitment processes can considerably be enhanced by using different software solutions like chatbots, onboarding software, applicant tracking systems and other. For example, many standard questions asked at a job interview can be handled by chatbots, while CVs can be screened and sorted out by an applicant tracking system. Data analytic tools allow HR departments use data from multiple sources thus compiling a more detailed picture of employees' lifecycles and the quality of various training programmes and other HR activities (Zahariev, Simeonov, & Zaharieva, 2021c). Data analytics also help predict whether or when an employee will quit and establish the main causes for this decision. The digitalization of HRM can have a number of benefits for the organization and its employees (Laktionova, Dobrovolskyi, Karpova, & Zahariev, 2019). First, replacing manual processes with software tools and automation technology reduces human errors, saves time and boosts productivity. Second, data-driven approaches provide HR departments with realistic employee profiles which help them analyse performance, identify skill gaps, get feedback and make better personnel decisions. The data-driven performance monitoring allows employers track their employees' productivity and other behaviour, as well as predict employee burnout and turnover (Zaharieva & Sylqa, 2020). Workforce analytics can also help HR specialists gather information about untapped in-house talent that can be further developed to contribute to the achievement of the goals of the organization (Zahariev, Angelov, & Zarkova, 2022a). The impact of the application of digital technology in various HRM practices on organizational effectiveness has been justified in a number of studies. This is seen in reduction of HR staff, cost savings, less administrative burden and better employee communication (Samson & Agrawal, 2020). However, to bring digitalization in HRM requires investment, skills and top management support and commitment. It also poses several challenges in terms of maintaining secrecy of input data and retaining manpower.

2.2. HRM in financial institutions

Unlike other industries that have a good balance between the four factors of production, the financial sector is heavilly dependent on one of the four – labour. This specifics of the sector highlights the important role HRM plays for the success of the companies that operate in it. Moreover, as financial services deal in intangible products, it is well suited for financial instituions to tap technological innovations like Blockchain, Big Data, the Internet of Things (IoT), cloud computing, artificial intelligence, biometric technologies and augmented/virtual reality to lower costs (Zahariev A. , et al., 2020b), boost productivity and offer superior customer service and experience. This will undoubtedly reduce human staff in these institutions to a required minimum. What is more, automation and technology not only replace jobs, but also companies need workforce that possesses the skills to provide for their competitive edge by exploiting the opportunities these advancements offer. HRM in financial institutions has some specifics which pertain to planning, acquiring the right people, development and retention, motivation, geographic location, cost control, effective training, reporting and legislative changes of workforce (Tomescu-Dimitrescu & Eleodor, 2019). In terms of the areas that the leaders of financial service organisations and HR specialists in them urgently need to address, a survey, conducted by PricewaterhouseCoopers among over 200 financial service and human resource leaders worldwide reports that as major at risk activities the respondents identify "untapped potential in data" and "missing out on key sources of talent and ideas". However, the report also states that 48% of financial services organisations say making workforce decisions using analytics is important, but they do not do it. A major conclusion the authors of the survey make is that HR experts need to be „at the forefront of moves towards greater automation and AI, rather than simply responding to changes in technology" (PwC, 2019).

3. METHODOLOGY AND MAIN RESULTS

3.1. Data and methods

The empirical data for this research was collected through a survey, comprising questions pertinent to the basic characteristics of the sample, the management, the planning of human resources, recruitment and selection, organization of work, performance appraisal and remuneration and the communications in the company. The survey was sent to the central offices of the licensed financial enterprises in Bulgaria with an option to be filled out online in Google forms, or using the paper version. The total number of respondents was 40, including 17 banks and 23 insurance companies. Valid responses were received from 18 respondents, which is a response rate of 40.5%. A part of the questions were based on a five-point unipolar Likert scale, where 1 = "Strongly disagree"; 2 = Disagree; 3 = "Undecided"; 4 = "Agree" and 5 = "Strongly agree". The collected data was entered and processed in MS Excel and analysed using the graphical method, correlation analysis and descriptive statistics.

3.2. Assesment and analyses of selected results of the survey

The data obtained from the survey conducted in the period July-August 2022 outline the following main characteristics of the sample:

- The headquarters of all companies are in the capital of Bulgaria - the city of Sofia.
- Most enterprises (44%) were founded after 1995, 39% at the beginning of the transition period 1990-1995 and 15% in the period before the transition to a market economy.
- Slightly more than half (56%) of the respondents are insurance companies and 44% are credit institutions with positive CAMEL evaluation results (Prodanov, Yaprakov, & Zarkova, 2022).
- The companies occupy a different position in terms of degree of digitalisation compared to their competitors, with the largest share (28%) of those who are classified in the second

quarter in terms of degree of digitalization, 22% - in the first quarter, and 22% are considered leaders in the industry by this indicator.

- More than half (72%) of the enterprises are large, with 61% employing more than 500 people and 11% - more than 250. The medium-sized enterprises make up 17% of the sample and small enterprises 11%.
- There is an operating trade union in only 17% of the companies.
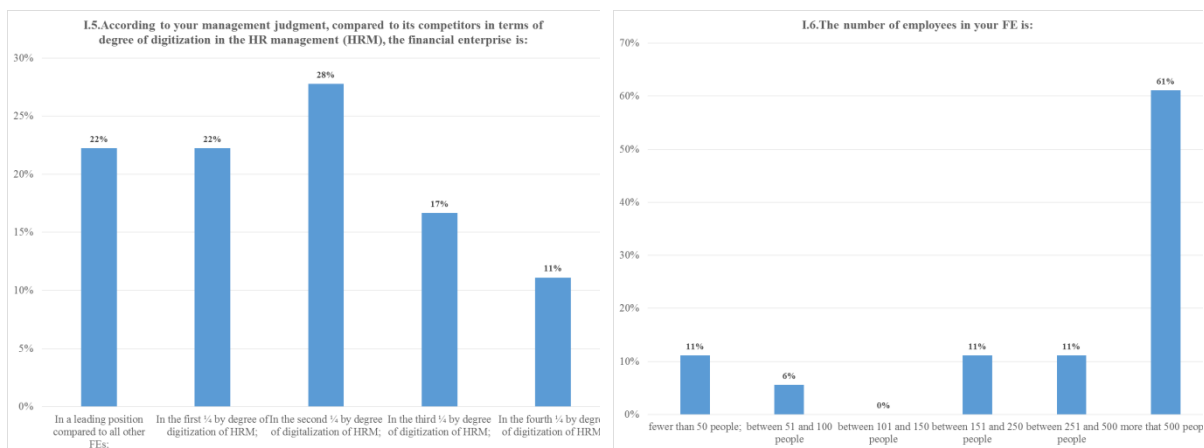- In most (89%) companies there is a human resource department.

Figure 1: Expert assessment of the degree of digitalisation in the financial firms compared to the competition and a profile of staff provision in the surveyed banks and insurance firms
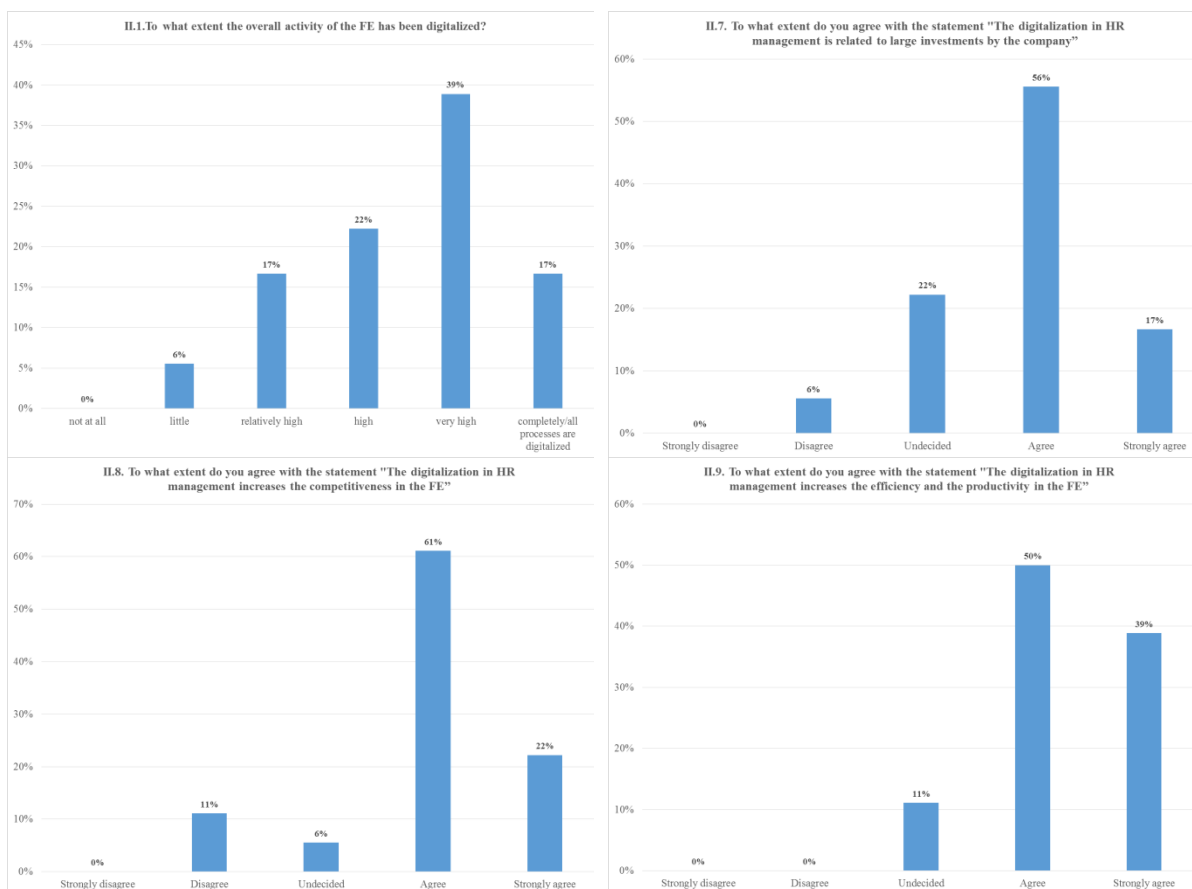

Figure 2: Expert assessment of the degree of digitalisation of the general HR management of in the financial enterprises

The survey data indicates that the digitalisation of the business activity in the financial sector is one of the priorities of the managers. To the question "To what extent the overall activity of the FE has been digitalised?", 17% of respondents stated that all processes have been digitalised, 39% - to a very large extent and 22% - to a large extent. 17% of the respondents believe that the activity of the company has been digitalised to a relatively high degree, and only 6% of them – very little. The importance of digitalisation is reflected in the overall policy and strategy of most companies in the financial sector. When asked whether digitalization is included in the overall strategy of the FE, 50% of the surveyed managers expressed strong agreement, 33% agreed and 17% were neutral. At the same time, the enterprises invest in the digitalisation of activities, including HR management. According to the data, about 77% of the FE invest in the digitalization of HR management. At the same time, 56% of the managers agree with the statement that the digitalisation of HR management is related to large investments by the company, and 17% - strongly agree. Digitalisation is perceived as one of the factors for increasing the competitiveness of the company. According to the data, 22% of the respondents fully agree with the statement that the digitalisation in HR management increases the competitiveness of the FE, and 61% express agreement. The managers also support the statement that the digitalisation in HR management increases efficiency and productivity in the FE, with as many as 39% of them express strong agreement and 50% - agreement.
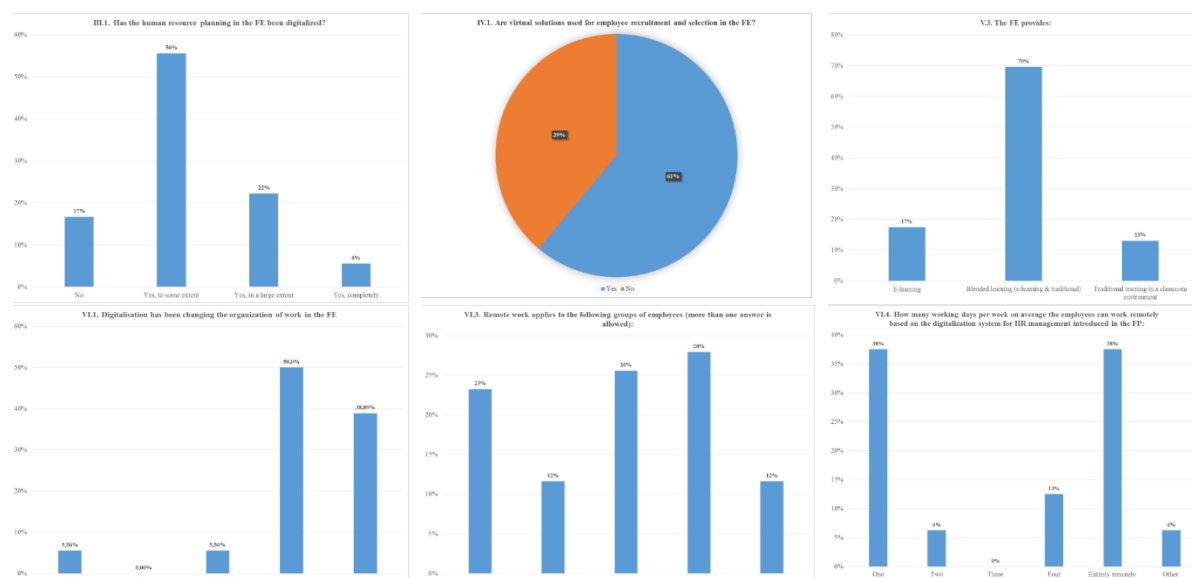

Figure 3: Expert assessment of the degree of digitalization of HR management in the financial enterprises – planning, recruitment, training and organisation of work

The different functions and activities related to HR management in the enterprises from the financial sector are digitalised to differing extents. It turns out that in only 6% of cases human resource planning is fully digitalised, in 22% it is digitalised to a large extent, in 56% of cases it is partially digitalised and in 17% it is not digitalised. In terms of HR recruitment, more than half (61%) of FEs use virtual solutions for the recruitment and selection of staff, while the rest rely on standard staffing methods. Digitalisation concerns to a certain extent also the training of the human resources (Zahariev, Laktionova, Zaharieva, & Kostov, 2022b). The data shows that 87% of FEs rely on e-learning or blended learning and only 13% prefer traditional forms of training for their staff. Another important aspect that digitalisation influences is the organization of work in the enterprises. Approximately 39% of the managers fully agree with the statement that digitalisation changes the organization of work, and 50% agree. The data show that 78% of the FEs have introduced remote work, and 22% have not. The categories that most often work remotely are IT specialists, back office specialists and managers/executives.

About 38% of the respondents state that they organize the work for certain categories of staff entirely remotely, 38% provide for remote work only for one day a week, 6% for two days a week, and 13% for four days a week. 6% of the respondents state that the number of days for remote work depends on the specific positions. The evaluation of the employee performance in the FEs is digitalized to a lesser extent. Only 33% of respondents strongly agree with the statement that it is done electronically, and 6% agree. This is also confirmed by the existence of a system for providing continuous digital feedback on the performance of the employees in the financial companies. Only 11% of managers completely agree that such a system has been established in the FE, 39% of them agree, and the rest either disagree or take a neutral position. Things are significantly different when it comes to the remuneration system. According to 44% of respondents, it has been entirely digitalised, 39% state that it has been mostly digitalised, and 17% state that it has been partially digitalised.
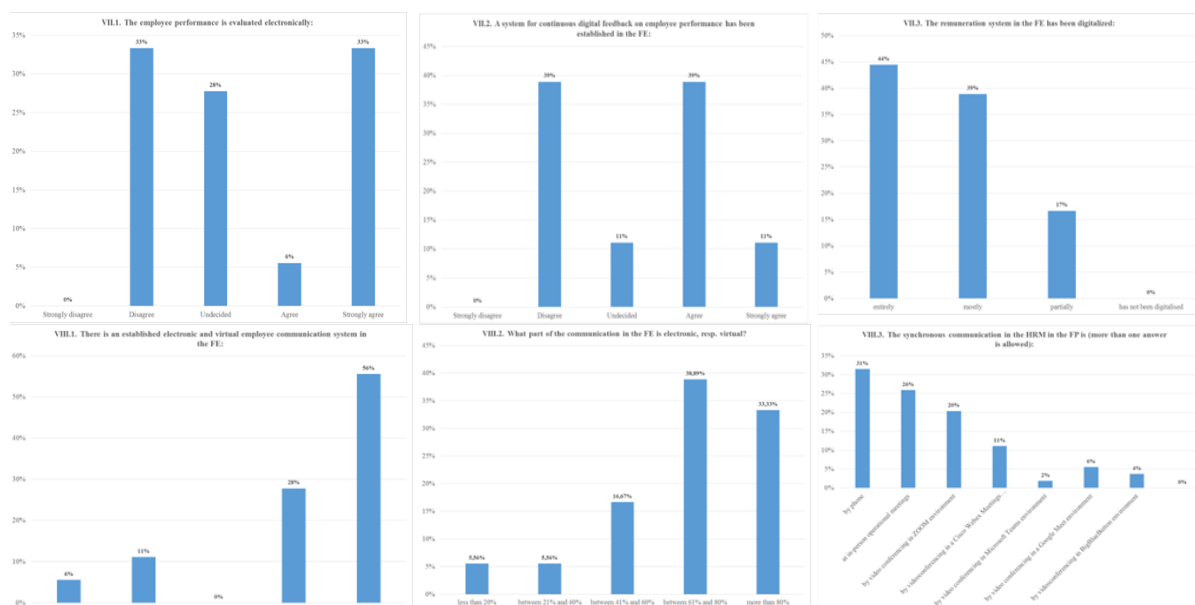

Figure 4: Expert assessment of the degree of digitalisation of HR management in the financial enterprises – employee performance evaluation, remuneration and communications

Employee communication is another aspect of digitalisation in HR management. The results of the survey show that the majority of the communication in the FE is done electronically or virtually, with 33% stating that more than 80% of the communication is electronic, resp. virtual, about 39% indicate a volume between 61% and 80 %, and approximately 17% - in the range of 41% to 60%. Just over 5% of respondents state that less than 20% of employee communication is done electronically or virtually. Most often, apart from phone calls and personal meetings, synchronous communication takes place by video conference meetings using various platforms like ZOOM, Cisco Webex, Google Meet and less often BigBlueButton and Microsoft teams.

3.3. Descriptive statistics and correlation analyses of HRM digitalisation factors of financial enterprises evaluated by Likert scale
To examine the correlations between the responses to the main questions related to the digitalisation of HRM in financial enterprises, nine questions/statements were selected as follows: II.2. The digitalisation transforms the management of the FE; II.3. Digitalisation is part of the overall strategy of the FE; II.4. Digitalisation concerns HRM in the FE; II.5. The digitalisation in HR management is part of the strategy of the FE; II.6. The FE invests in the digitalisation in HR management; II.7. To what extent do you agree with the statement "The digitalisation in HR management is related to large investments by the company"; II.8.

To what extent do you agree with the statement "The digitalization in HR management increases the competitiveness in the FE "; II.9. To what extent do you agree with the statement "The digitalization in HR management increases the efficiency and the productivity in the FE"; VI.1. "Digitalization has been changing the organization of work in the FE". The collected responses were evaluated by a unipolar Likert scale from "1" to "5" and processed with MS Excel analytical functions "Descriptive Statistics" (Table 1) and "Correlation" (Table 2).

	II.2.	*II.3.*	*II.4.*	*II.5.*	*II.6.*	*II.7.*	*II.8.*	*II.9.*	*VI.1*
Mean	4.22	4.33	3.94	3.83	3.72	3.72	3.94	3.83	4.17
Standard Error	0.17	0.18	0.17	0.19	0.18	0.24	0.21	0.28	0.23
Median	4	4.5	4	4	4	4	4	4	4
Mode	4	5	4	4	4	4	4	4	4
Standard Deviation	0.73	0.77	0.73	0.79	0.75	1.02	0.87	1.20	0.99
Sample Variance	0.54	0.59	0.53	0.62	0.57	1.04	0.76	1.44	0.97
Kurtosis	4.15	-0.87	2.33	0.52	0.47	2.06	1.35	2.00	5.80
Skewness	-1.40	-0.68	-0.95	-0.50	-0.41	-1.25	-1.08	-1.48	-2.03
Range	3	2	3	3	3	4	3	4	4
Minimum	2	3	2	2	2	1	2	1	1
Maximum	5	5	5	5	5	5	5	5	5
Sum	76	78	71	69	67	67	71	69	75
Count	18	18	18	18	18	18	18	18	18
Confidence Level(95.0%)	0.36	0.38	0.36	0.39	0.37	0.51	0.43	0.60	0.49

Table 1: Descriptive statistics of selected HRM digitalisation factors of financial enterprises evaluated by Likert scale

From the selected nine questions/statements of the highest average value are II.3. (4.33 score on the Likert scale) and II.2 (with a score of 4.22), related to the strategy for the development and the overall management of the FE. With the lowest mean values of 3.72 are questions II.6. and II.7., which are directly related to the financial and budgetary aspects of supporting digitalisation in HRM in the financial enterprises. With the highest standard deviation of 1.20 in the sample is the answer to the statement that "the digitalization in HR management increases the efficiency and the productivity in the FE".

	II.2.	*II.3.*	*II.4.*	*II.5.*	*II.6.*	*II.7.*	*II.8.*	*II.9.*	*VI.1*
II.2.	**1.0000**								
II.3.	0.6984	**1.0000**							
II.4.	0.8000	0.5639	**1.0000**						
II.5.	0.7838	0.6831	0.8083	**1.0000**					
II.6.	0.5462	0.6800	0.5093	0.7134	**1.0000**				
II.7.	0.0877	0.0502	0.1372	*-0.2819*	-0.1836	**1.0000**			
II.8.	0.6650	0.4688	0.5524	0.5004	0.2441	0.2465	**1.0000**		
II.9.	0.0446	0.0639	0.3265	0.3429	0.2715	-0.0401	0.3276	**1.0000**	
VI.1	*0.9243*	0.6228	0.6722	0.7218	0.4632	-0.0098	0.7641	0.0746	**1.0000**

Table 2: Correlation analyses of selected HRM digitalization factors

The correlogram of the selected nine questions/statements gives the highest positive correlation between II.2. and VI.1. In the zone of the highest negative correlation is the relationship between survey questions II.5 and II.7., which shows that the introduction of digitalisation in HRM does not always and everywhere require large corporate investments.

4. CONCLUSION

The present research is pioneering for the Bulgarian banks and insurers (Zahariev A. , et al., 2020d) after the first 30 months of the pandemic crisis (after Q1 of 2020) and was conducted in parallel with the emergence of new challenges for financial enterprises related to inflation (Zahariev, Radulova, Aleksandrova, & Petrova, 2021), macro-financial imbalances (Zahariev, et al., 2020a) and the war in Ukraine that outburst in 2022, which definitely impacted entire world and the Russian Federation itself (Sabitova, Shavaleyeva, Lizunova, Khairullova, & Zahariev, 2020c). In fact, the global economy today has lost its sustainability and the "green" development goals (Roleders, Oriekhova, & Zaharieva, 2022) will have to be laid aside for now due to force majeure factors . The research is based on data collected through a survey with return rate of 45% as of 31.08.2022. The interviewed ten insurance companies form 65.35% of the gross premium income of the Bulgarian general insurance sector as of 30.06.2022 and as a commercial brand represent 43 .5% of the companies licensed in the sector. The interviewed credit institutions are commercial banks licensed by the Bulgarian National Bank, which as of 30.06.2022 manage 70.04% of the assets in the banking system and as a commercial brand represent 47% of the companies licensed in the sector. The research confirms the important role of digitalisation in HR management in financial enterprises, which is found to be coupled with parallel digitalisation in overall management and product channels for customer service. Digitalisation in HRM itself is found to be often a product of management strategy and to a lesser extent a result of significant investment by financial enterprises.

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USAGE OF ELECTRONIC EDUCATION SERVICES IN BULGARIA

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ABSTRACT
In the past twenty years, the range of electronic services offered by educational institutions in Bulgaria has increased substantially, allowing schools, universities, and vocational training centers to offer flexible learning options. These capabilities proved essential during the COVID-19 pandemic when most educational institutions switched to online teaching. The share of electronic services users among the population between 16 and 74 years of age almost tripled between 2019 (2.3%) and 2020 (6.9%). This paper explores the variation of usage rates of four types of electronic education-related services: online courses and examinations provided by schools and universities, private educational services, and administrative services like issuing electronic diplomas and certificates. The propensity to use these services is modeled within a multilevel logistic regression model using a sample of internet users conducted in July-August 2021. The results reveal a gender difference in the usage of electronic services, with women being more likely to access school and university services than men. Respondents living in rural areas were less likely to use private e-services. However, there were no significant differences between urban and rural dwellers concerning the rest of the service types. Individuals using one service type were likelier to use all the others. The regional variation of usage patterns indicates a positive association between the use of university and privately supplied electronic services.
Keywords: digitalization, education, electronic services

1. INTRODUCTION
In the late winter of 2020, the world began bracing for the shock of COVID-19. In the following two years, societies needed to adapt to a way of living under lockdowns, social distancing and disrupted educational systems. During the lockdowns, schools, universities, and other private educational institutions moved to ensure the continuity of education by switching to online learning methods that are not tied to a specific place. The online delivery of government services, including education-related services, helped to reduce the need for dangerous face-to-face contact. With document processing, organizations can build a custom AI model to extract information from documents and use it for different types of analysis. (Mateev, 2022). The abrupt shift to online learning and digital delivery of administrative services raised concerns that parts of the population may suffer disadvantages because they lack the equipment or the necessary skills to use these online services. Despite a rapid expansion over the last ten years in Bulgaria, the country still had one of the lowest shares of households with internet access (84%) among European Union countries: (92% on average) in 2021 (Eurostat 2021). This access gap is less relevant for education-related e-services oriented toward younger people: 96% of households with children had internet access in 2021 (National Statistical Institute 2021). However, physical access to computer equipment and the internet is only part of the digital divide: effectively using these services requires a degree of digital literacy and skill,

which are distributed unequally in society (Coleman 2021; van Deursen & van Dijk 2014; Helsper & Galácz 2009). This paper contributes to the research on e-government adoption by exploring the association between digital skills, socio-demographic factors, and the adoption of education-related electronic services in a sample of Bulgarian internet users. We distinguish the services of four provider types: primary and secondary education (schools), higher education (universities), private providers, and government agencies related to education. A multilevel logistic regression model showed a positive association between educational attainment, digital skills, prior experience with e-commerce, and the use of all four service types among economically active people (employed and unemployed). A separate analysis of the student's adoption of these services showed a positive association between their prior experience with e-commerce but no evidence of education or digital skill level differences.

2. BACKGROUND

Ever since their spread in the 1990s, the adoption of electronic services by the general population has drawn considerable research interest. The technology acceptance model (Davis 1989) and its extensions have been among the primary tools employed in technology adoption studies. The model explains the behavioral intent of persons to use new technology in terms of two major factors: its usefulness and its ease of use perceived by their intended users. Although their findings differ depending on the context, numerous e-government and e-learning adoption studies report links between perceived usefulness and ease of use, behavioral intent, and actual usage (Chen & Aklikokou 2020; Saleh, Nat & Aqel 2022). Furthermore, the relationships between perceived usefulness and ease of use and the behavioral intention to use e-government services and e-learning have been found to vary with socio-demographic characteristics and between different cultures (Carter & Weerakkody 2008; Zhao, Wang & Li *et al.* 2021). Venkatesh & Davis (2000), Venkatesh, Morris & Davis *et al.* (2003), Venkatesh & Morris (2000), and He & Freeman (2010) identify age and gender as important factors associated with attitudes towards adopting electronic services. However, these results vary between contexts. Regarding e-government adoption, studies from different countries produce inconsistent results: while Bélanger & Carter (2009) reported no gender effects (USA), Sarabdeen & Rodrigues (2010) (Dubai) found men significantly more likely to be e-government users than women. Regarding the adoption of e-learning during the COVID-19 outbreak, Jamalova & Bálint (2022) found that gender was a significant moderator variable of perceived usefulness and behavioral intent but did not find a significant gender difference in perceived ease of use in a study of Hungarian universities. Their finding contradicts the pre-COVID results of Tarhini, Hone & Liu (2014), and the authors explain the absence of a gender effect with the mandatory nature of e-learning during the lockdown. Studies on e-learning report a moderating effect of age (Acharjya & Das 2022; Wang, Wu & Wang 2009; Jamalova & Bálint 2022) and that older persons tend to be more reluctant to adopt e-learning. E-government adoption research largely agrees that age is a significant predictor of use (Dwivedi & Williams 2008; Mensah & Mi 2018; Mensah, Zeng & Luo 2020). Studying e-government adoption in the U.K., Dwivedi & Williams (2008) found that persons with low educational attainment were less likely to use electronic services. The authors explain this finding with their lesser experience with computer technologies (Venkatesh & Davis 2000) and the government's more intensive promotion of these services to the country's elites. Subsequent research has reached inconsistent conclusions. In studies of electronic and mobile government services adoption in China, Mensah & Mi (2018) found that education was not a significant predictor of the willingness to use these services, in contrast to the findings of Taipale (2013), Mensah, Zeng & Luo (2020) and Rodriguez-Hevía, Navío-Marco & Ruiz-Gómez (2020). Apart from educational attainment, the ability to handle the necessary computer equipment and interact with online resources is essential for users of electronic services, and persons with poor digital

skills are less likely to engage with e-government services (Rodriguez-Hevía, Navío-Marco & Ruiz-Gómez 2020). Similarly, Saleh, Nat & Aqel (2022) conclude that computer anxiety negatively affects the attitude toward e-learning. Income differences may also relate to adopting e-government and e-learning technologies, though the results vary between studies (Reddick 2005; Taipale 2013). (Zhang & Zhu 2021) recently investigated a possible urban/rural divide in China and reported differences in the association between perceived usefulness, perceived security, and the intention to use e-government services between rural and urban residents. Concerning online learning, Zhao, Cao & Li *et al.* (2022) point to the existence of an urban/rural divide in computer self-efficacy in motivation.

3. DATA

The data consists of a sample of 1039 internet users who have used electronic e-government services in the previous 12 months (users) and another sample of 385 persons who had not used any e-government service during the same period. Both samples were collected using an identical sampling design, except that residents of big cities were oversampled in the non-users survey. The participants (15 years or older) in both groups were interviewed face-to-face in the period between June and August 2021. The respondents provided information on whether they had accessed electronic services provided by governmental agencies, public and private educational, and healthcare institutions in the twelve months before the interview. In the field of educational e-services, the questionnaire included questions about the use of schools (primary and secondary education providers), universities (higher education providers), non-governmental institutions, private educational institutions, and administrative services related to the issue of apostilles, and electronic copies of diplomas and other certificates. The e-services provided by the three providers included online e-learning courses, online examinations and consultation, online access to grades and electronic diaries, online enrollment in schools and universities, as well as the electronic payment of fees. The questionnaire also included background questions about the type of place of residence (city, small town, or rural), gender, occupational status (retired, employed, self-employed, unemployed, and student), the level of educational attainment (primary, secondary, and higher), self-reported digital skills, measured in five categories between "low" and "high," and their usual frequency of online shopping: never, rarely (a couple of times a year), and often (more than once a month). In the subsequent analysis we merged the levels of the digital skills variable to three categories: low, middle, and high. The employed and unemployed respondents also gave information about their monthly income (6 categories). In the sample of users, the shares of persons who had accessed education-related services were: school services: 30%, university services: 18.7%, administrative services 18.6%, and private online services: 16.5%.

4. MODEL

We expected students, economically active, and retired people to use electronic educational services differently: especially during the COVID-19-related school- and university closures, students were left with no option but to switch to online learning. As the respondents' age is not contained in the data, the occupational status of the respondents serves in part as a proxy measure of age. Therefore, we expected that employed and unemployed respondents would have less need for school e-services but would access these when assisting their children with online education. Furthermore, we excluded retired persons from the analysis, as all e-service types considered here are oriented toward younger people. Only 3 out of 114 retirees in the sample had accessed school-related services, and none had used any other services. These arguments motivated us to estimate two models for adopting educational services: one for the students subsample (n = 159) and another for the economically active (n = 1091). The two models also differ in terms of the explanatory variables, as the information about income was

not collected from students. We model the variation of the adoption probability for each type of e-service using a logistic regression model that includes the main effects of the explanatory variables: gender, educational attainment, type of residence, income group, digital skills, and online shopping experience. The linear predictors also include random effects for each of the 28 administrative regions of Bulgaria that account for unmeasured differences between these regions, such as varying internet access quality and ethnic composition. The random effects follow a multivariate normal distribution with zero mean and covariance matrix that is estimated within the model in order to capture dependencies between the random effects induced by an uneven distribution of educational institutions between the regions. The posterior distribution of the model is explored using four MCMC chains with 6000 iterations of each chain (NUTS sampling). The model includes broad prior distributions $N(0, 2)$ for the fixed effects and unit mean exponential prior distributions for the variance parameters of the regional effects. The prior for the correlation coefficients is LKJ(1). We experimented with different specifications of the prior distributions but did not observe substantial changes in the main conclusions of the analysis.

5. RESULTS
Table 1 summarizes the posterior distribution of the fixed effects of the logistic regression models for the economically active population. The posterior distribution of the gender effects shows no evidence of different behavior of men and women concerning the usage of three of the four types of services. The exception is a higher propensity of women to access school e-services compared to men. In our opinion, this finding does not suggest a lack of ability for men to use these services. Instead, it reflects a traditional division of labor in Bulgarian families, where women tend to be more involved in their children's education than men. The model shows no substantial variation in the service adoption probability between income groups, except for university e-services, where high income is associated with a low usage probability. As the questionnaire did not distinguish between part-time and full-time employment and age is not present in the model, we argue that this effect captures an age difference between the respondents. Younger people still studying at a university tend to receive lower wages and are more likely to work part-time than other workers. The usage propensity for administrative and private educational e-services does not appear to vary substantially between income groups. The model shows no evidence of an association between employment status and the propensity to use any of the e-service types. The model indicates that low levels of educational attainment were associated with a lower propensity to use all types of e-services. The 95% credible intervals for the coefficients of the primary education indicator include zero for every service type, but this is related to the low number of respondents (14) in that category, which results in high posterior standard errors. Apart from the effect of education, the model predicts a lower usage probability across all four service types for persons with poor self-assessed digital skills.

Table following on the next page

		Schools		Universities		Administration		Private/NGO	
Variable	Level	Mean	StdDev	Mean	StdDev	Mean	StdDev	Mean	StdDev
Gender (ref: male)	Female	**0.80**	0.20	0.16	0.25	0.23	0.23	0.38	0.24
Residence type (ref: city)	Rural	-0.01	0.26	-0.15	0.35	-0.16	0.34	**-1.24**	0.41
	Small town	0.11	0.24	-0.03	0.33	-0.57	0.34	**-1.41**	0.42
Income (ref <650)	650-1250	0.25	0.39	-0.52	0.47	-0.38	0.44	-0.13	0.46
	1251-1850	0.16	0.41	-0.95	0.50	-0.76	0.48	-0.65	0.49
	1850-2450	-0.06	0.46	**-1.92**	0.64	-0.48	0.53	-0.80	0.57
	2451-3000	-0.02	0.49	**-1.36**	0.61	-0.05	0.53	-0.08	0.55
	>3000	-1.25	0.69	**-1.50**	0.73	-0.91	0.68	-1.08	0.74
	Missing	0.06	0.45	**-1.29**	0.57	**-1.50**	0.58	-0.99	0.56
Labor status (ref: employed)	Unemployed	0.30	0.44	-0.31	0.57	-0.57	0.58	0.04	0.54
Education (ref: higher)	Primary	-2.10	1.28	-1.56	1.39	-0.21	1.06	-0.15	1.09
	Secondary	**-0.56**	0.19	**-0.80**	0.27	**-0.56**	0.24	-0.99	0.56
ICT skills (ref: high)	Middle	**-0.50**	0.20	**-0.55**	0.28	**-0.58**	0.25	-0.47	0.26
	Low	**-1.36**	0.48	**-2.03**	0.86	**-1.35**	0.62	**-3.10**	1.12
Online shopping (ref: never)	Rarely	**0.65**	0.26	**0.92**	0.42	**0.70**	0.35	0.53	0.35
	Often	**0.76**	0.30	**1.47**	0.45	**1.07**	0.39	0.69	0.39

Table 1: Logistic regression results for the economically active sample. Posterior means and standard deviations. Coefficients with 95% credible intervals not including zero are set in boldface.
(Source: own calculations)

In the case of private educational e-services, the 95% central credible interval includes zero, but the posterior probability that it is less than zero is still 97%. The frequency of online shopping, used as a measure of the respondents' online experience, is positively associated with usage propensity for all service types except those delivered by private providers. For private e-services, the model only shows evidence of a rural/urban divide, with rural and small-town residents having a lower predicted usage probability. This finding is significant because of the oversampling of big-city residents in the non-users sample. A possible explanation is that private education providers tend to be concentrated in the large cities in Bulgaria. The lack of evidence of an urban/rural divide for the rest of the e-service types should be regarded with caution, as the effects reflect the survey's sampling design that may mask an urban/rural difference in usage probabilities.

		Schools		Universities		Private/NGO		Administration	
Variable	Level	Mean	StdDev	Mean	StdDev	Mean	StdDev	Mean	StdDev
Gender (ref: male)	Female	-0.29	0.38	0.16	0.48	0.01	0.40	-0.38	0.43
Residence type(ref: city)	Rural	-0.34	0.52	0.12	0.72	**-1.33**	0.70	-0.63	0.64
	Small town	0.06	0.49	0.21	0.62	0.75	0.49	-0.31	0.53
ICT skills (ref: middle)	High	-0.66	0.65	**-2.09**	0.89	-1.17	0.68	-1.30	0.73
Online shopping (ref: never)	Rarely	**1.22**	0.51	**1.55**	0.61	0.96	0.57	0.67	0.57
	Often	**1.94**	0.57	**1.88**	0.65	**1.51**	0.58	**2.54**	0.61

Table 2: Logistic regression results for the students sample: fixed effects posterior means and standard deviations. Coefficients with 95% credible intervals not including zero are set in boldface.
(Source: own calculations)

For all four types of e-services, the random effects indicate the presence of between-region variation in adoption rates (Figure 1) after accounting for the fixed effects part of the model. The posterior average standard deviations range from 0.86 (school services) to 1.01 (administrative services), and all standard deviations have 95% credible intervals with a lower limit greater than 0.54.
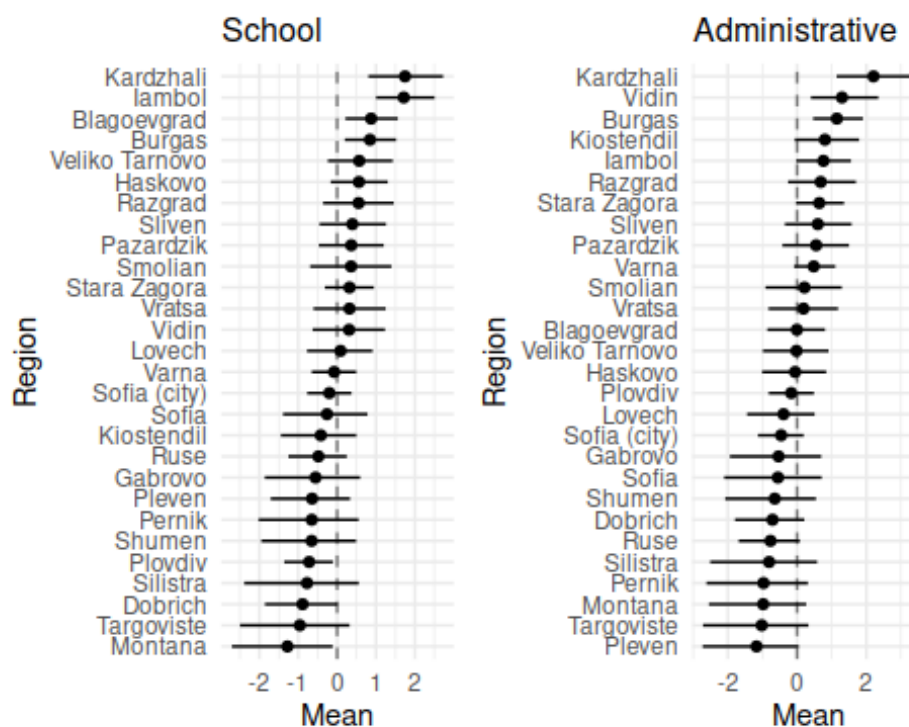

Figure 1: Posterior means and 95% credible intervals of region-level intercepts for school- and administrative e-services. University and private services omitted for brevity. (Source: own calculations)

The uneven distribution of educational institutions between the regions may partially explain this variation, as most universities and private institutions are located in larger cities. The oversampling of non-users of e-government services in large cities may be another factor. The only correlation with a 95% credible interval covering zero is between the regional effects of school and administrative services. All other correlations are positive and range from moderate (university and administrative services: 0.47) to strong (administrative and private services: 0.84), indicating that regions with a high usage propensity for one of the services also tended to show a high usage propensity for the other types. The regional estimates of the regional effects may provide the basis for further analysis of the differences between the regions and help identify local success factors. An example may be the region of Burgas, which contains the fourth largest city in the country and exhibits one of the larger propensities of educational e-services adoption despite the survey's sampling design. In contrast to the economically active model's findings, the model for the students sub-sample (Table 2) does not reveal evidence of gender, education, or digital skills effects on the predicted adoption probabilities. However, there were no students in the sample with low self-reported digital skills. The large coefficients for the education attainment levels reflect that students with primary education were interested in services provided by schools. In contrast, students with a secondary school degree were interested in accessing university e-services.

A robustness analysis showed that this results from a low number of students with higher educational attainment in the sample (8 respondents), all of whom reported a high level of digital skills. Similar to the results for the economically active persons, students in rural areas had a lower propensity to access private e-services. Students who lacked a prior experience with e-shopping were less likely to engage with all types of e-services considered in the model.

6. CONCLUSION

This study analyzed the adoption of education-related electronic services using a sample of Bulgarian internet users. For the economically active population, the results showed evidence of a persisting skills-based divide in Bulgaria: lower education, digital skills levels, and e-commerce experience were associated with a lower adoption rate of publicly and privately provided e-services. For a sample of students, the model showed evidence only of an association between prior e-commerce experience and the adoption rate of the services. A limitation due to the sampling design of this study prevents the exploration of rural/urban differences. However, the model points to an urban/rural divide in the access to privately supplied electronic education services. The lower propensity to access education-related services by persons with lower levels of digital skills may be a call to examine the existing e-government services related to education. Simpler user-facing interfaces and better organization of the information on school, university, and government agencies' online sites may lower the effort to use them and extend the benefit of these e-services to users with lower digital abilities.

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PERFORMANCE ANALYSIS OF THE BALANCED INVESTMENT FUNDS IN THE REPUBLIC OF CROATIA DUE TO THE COVID-19 PANDEMIC

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ABSTRACT
This paper analyzes the performance of balanced investment funds in the Republic of Croatia due to the COVID-19 pandemic. The work aims to analyze the operations of balanced investment funds from April 2017 to March 2022. Also, efforts are being made to investigate the impact of the COVID-19 pandemic on their operations. The paper deals theoretically with the field of investment funds, studying the topic of the COVID-19 pandemic and its effect on the fund industry. Furthermore, an overview of open (UCITS) investment funds with a public offer in the Republic of Croatia is provided. The actual analysis of the performance of balanced investment funds in the Republic of Croatia is carried out by statistical analysis of the net asset value (NAV) and fund yield. In addition to the statistical analysis, a risk analysis is carried out, that is, an analysis of the performance indicators of the funds. In the end, the results are explained, and a conclusion is drawn.
Keywords: Balanced investment Funds, COVID-19, NAV, yield, Sharpe ratio, Sortino ratio

1. INTRODUCTION
Many distinguished economists study the theory and operation of investment funds. Since investment funds, or the investment companies that manage them, operate in the capital markets, it is necessary to explain the concept of the capital market briefly. *Capital markets* are where securities such as stocks and bonds are traded. The regulated place where these securities are traded is called the stock exchange. Among the most important capital market participants (intermediaries) can be classified as investment funds, the companies that manage them. A developed capital market is an important indicator of a country's strong financial and economic system and a key assumption for further development. Countries with highly developed capital markets, such as the USA, the United Kingdom and Japan, stand the best in the international economic order. There are many definitions of investment funds. According to Novak (as cited by Klačmer Čalopa and Cingula), "Investment funds are channels through which the savings of a large number of individual investors can be directed into shares, bonds or short-term securities on the money market." (Klačmer Čalopa and Cingula, 2009, p. 103). According to Mishkin and Eakins, "Investment funds pool the funds of a large number of small investors by selling them shares in the fund and use the collected funds to buy securities." (Mishkin and Eakins, 2019, p. 483). According to Davis and Steil, "Investment funds are, in the simplest terms, vehicles for pooling assets for investment" (Davis and Steil, 2001, p. 16).

According to Kidwell, Peterson, Blackwell, and Whidbee, "A mutual fund is an open-end investment company, the most common type of investment company." (Kidwell, Peterson, Blackwell, Whidbee, 2003, p. 648). The European Commission defines investment funds as "Investment products created with the sole purpose of collecting investors' capital and jointly investing that capital through a portfolio of financial instruments such as shares, bonds and other securities." ("European Commission [EC]", undated) . All authors conclude that investment funds have become one of the most important factors in capital markets. From the definitions, it can be concluded that investment funds are a tool that enables "small" investors to participate in the capital market. Collected funds from investors, investment funds (companies that manage them, fund managers) further invest in financial instruments on the capital market to achieve a certain required return for their clients. According to the organizational form, the primary division of investment funds is the division into open and closed investment funds. It is important to note that when we talk about open investment funds, we often mean open investment funds with a public offering or UCITS funds. UCITS, an open-ended investment fund with a public offering, is the most popular investment fund in the capital markets. Therefore, showing the division of available investment funds according to investment goals is necessary. "Depending on investments in certain types of securities, open-end investment funds are divided into the following: Equity funds, Bond funds, Balanced funds and Cash funds" (Klačmer Čalopa and Cingula, 2009, p. 111). Balanced investment funds represent a moderately risky group of investment UCITS funds. The moderate riskiness stems from the fact that their asset structure consists of roughly equal proportions of bonds and shares. Therefore, they are safer to invest in than stock funds and achieve higher returns than bond funds. It is precisely the balanced structure of assets that makes them interesting for analysis. At the beginning of 2020, the world was gripped by the biggest pandemic since the great Spanish flu pandemic of 1918, the COVID-19 pandemic. COVID-19 is an infectious disease caused by the SARS-CoV-2 virus that causes respiratory problems in the patient. It can also cause death in immunocompromised people. The spread of the disease and the declaration of a pandemic in March 2020 caused a significant shock in the global capital markets. Panic and uncertainty prevailed among investors in the capital markets. The work aims to analyze the operations of balanced investment funds from April 2017 to March 2022. Also, efforts are being made to investigate better the impact of the COVID-19 pandemic on their operations. A large part of the observed period marks the time of the pandemic. This is precisely why the impact of the pandemic on the fund industry can be observed.

2. THE EFFECTS OF THE COVID-19 PANDEMIC ON THE BUSINESS OF UCITS FUNDS IN CROATIA

The year 2020 was marked by the global pandemic of COVID-19. In March 2020, the national economies of countries worldwide began to shut down to prevent the further spread of the virus and to bring the pandemic under control. This consequently resulted in a sharp decline in economic activity. In the second quarter of 2020, the economy of the Republic of Croatia recorded a decline of 15.1% annually. During the spring of 2020, the crisis was brought "under control," which enabled a better (than expected) tourist season in 2020 (slight recovery of economic activity during the summer). In autumn, the second wave of the pandemic appeared, which caused a renewed decline in economic activity. On an annual level, the decline in economic activity in the Republic of Croatia amounted to 8.4%, the largest in history. The administrative unemployment rate at the end of December 2020 was 9.5%. The annual deflation rate at the end of 2020 was -0.3%. At the end of the year, the budget deficit amounted to -7.4% of GDP, the public debt increased by 15.9 percentage points and reached 88.7% of GDP ("HANFA," 2021, p. 15). The asset value of investment funds fell by 32% in March 2020 compared to February. In April 2020, the value of investment funds' assets started to recover.

In February 2021, the value of the fund's assets increased by 21% compared to March 2020, which indicates a positive recovery trend. On an annual basis, if February 2020 and February 2021 are observed, the value of the fund's total assets is 18% lower. Due to the good education of investors (financial literacy), no large outflow of citizens from investment funds was recorded. The good reactions of the fiscal and monetary authorities, combined with the correct initiatives of the regulator, ensured the return of investor confidence and the stabilization of the market. According to shareholder categories, in the total assets of UCITS funds at the end of 2020, the most significant part of assets, 64%, belongs to natural persons (almost 207 thousand citizens). The annual analysis of the European Asset Management Association showed that the investment fund sector showed significant resilience in 2020 (Krstulović, 2021).

2.1. Literature review

Studying the impact of various crises on financial market operations is very interesting. For this reason, many authors and institutions deal with analyzing just such phenomena. In order to better understand the impact of the crisis on the economy, it is necessary to understand the situation from the macroeconomic side as well. Because of this, Čavrak (2020) made an analysis and a macroeconomic framework for mitigating and exiting the coming economic crisis. In a scientific article, he explains how and why the (then emerging) economic crisis is unique in history. The professor concludes that the crisis was caused by a medical shock, i.e., the global pandemic of COVID-19 and the government's response to that pandemic. It presents the curve of the pandemic shock and the curve of the economic crisis with which it tries to explain how "firstly, the time dynamics of the health shock precedes the economic shocks and secondly, the profile of the economic shock is inverse concerning the intensity of the health shock, i.e., the health protection measure." (Čavrak, 2020, p. 6). The curves explain how the level of government reaction in the form of strict health measures will affect the level of economic recession. (Čavrak, 2020, pp. 4-8). In order to better explain the impact of a health shock on the economy, the author uses an adapted standard AS-AD model (the inflation level is used instead of the price level). "Unlike all economic crises known so far, this latest one contains as many as four shocks: Supply shock, Demand shock, Fall of expectations and growth of uncertainty, and Shock of rapid bad measures" (Čavrak, 2020, p. 8). A simplified economic model shows how an initial health shock causes a supply shock as production and supply chains are disrupted. Stocks are increasingly consumed, which leads to a breakdown in supply. Due to a large number of infected and dead, there is fear and uncertainty, which in turn causes a drop in consumption. This causes a drop in cash flows and causes an increased risk of company bankruptcy. Businesses fight against "bankruptcy" by laying off workers, which causes increased unemployment. Unemployment leads to the inability to repay loans and an increase in the level of "bad loans." This is where the danger lies for the financial market, including investment funds. The risk for the financial sector is increasing significantly, household purchasing power is decreasing, and demand is continuously falling. Consequently, this further increases uncertainty and risk for all stakeholders. The circle closes, and the loop starts spinning again, which multiplies the adverse effect (Čavrak, 2020, pp. 8-10). In order to prevent a possible depression with the characteristics of a significant drop in GDP and deflation (stagflation), the author states that it is necessary to implement a comprehensive package of monetary and fiscal policy measures. These measures would reduce uncertainty and risk, strengthen trust among stakeholders and mitigate the negative effect of health shock. It is precisely the reduction of uncertainty and risk that would restore confidence to investors in the capital market. Monetary and fiscal policy measures need to be combined with financial regulation, social insurance, industrial policy and trade policy precisely because of the complexity of the situation (Čavrak, 2020, pp. 13-17).

Furthermore, in the scientific-research paper "Analysis of the impact of the COVID-19 pandemic on the operations of open-end investment funds in the Republic of Croatia", an attempt is made to investigate the impact of the growth of new cases and the number of deaths from COVID-19 in the period from January 1, 2020. until 30.06.2020. to the operations of ZB active UCITS fund, ZB bond UCITS fund, ZB global UCITS fund and ZB plus UCITS fund. All these funds are structurally different, which is a reasonable basis for analysis (Štimac and Prpić, 2020, pp. 1-2). After the research, the authors concluded that "the daily number of new cases and deaths had a statistically significant impact on the yield of all UCITS funds in the Republic of Croatia, regardless of the fund's investment structure. The highest correlation was recorded with equity funds that have assets exposed to high-risk securities" (Štimac and Prpić, 2020, p. 47). Regarding the analysis of the index, i.e., the impact of the pandemic on the German and Italian markets, the authors conclude that a high correlation between the impact of the pandemic and the decline in the value of the index has been proven (Štimac and Prpić, 2020, pp. 47-48). The review of these two scientific research papers concludes that the health crisis caused by the COVID-19 pandemic had a powerful impact on the financial sector, i.e., the sector of investment funds in Croatia and the world. The initial shock led to increased uncertainty and risk for investors, which resulted in the withdrawal of funds from investment funds and a decline in the value of the shares and the net asset value of the funds. In order to restore the confidence of investors, that is, in order to mitigate the fall in the value of the assets of the funds, the Government of the Republic of Croatia, the CNB and other state institutions (primarily HANFA) had to adopt strict fiscal and monetary policy measures.

3. ANALYSIS OF THE UCITS FUNDS IN CROATIA

As of the end of 2021, there are 93 open investment funds with a public offering operating in the Republic of Croatia. From 2016 to the end of 2021, the number of investment funds and the net value of assets mostly grew. The exception is the year 2020, i.e., the global pandemic of COVID-19, which caused a great shock in the financial markets. The shock outcome was a significant drop in the net asset value of open investment funds with a public offering. In 2021, the net asset value of investment funds with a public offering approached the level of NAV at the end of 2019. Table 1 shows the trend in the number of open investment funds with a public offer and their net asset value from 2016 to 2021.

Year	2016.	2017.	2018.	2019.	2020.	2021.
Number of funds	88	92	93	96	96	93
Net asset value (in thousands of HRK)	18.440.776	18.449.606	19.117.203	22.577.123	18.216.156	21.512.344

Table 1: Movement in the number of open investment funds with a public offer and movement in their net asset value in the period from 2016 to 2021
(Source: Compiled by authors according to "HANFA", 2022, p. 140)

These funds managed assets worth around HRK 21.5 billion, which represents an increase of 18.1% compared to the crisis year 2020. Bond funds achieved the highest growth in net assets of HRK 0.9 billion (6.4%) annually. Equity funds achieved growth in net assets of HRK 0.8 billion (46.0%) compared to the previous year. Balanced funds achieved growth in net assets of HRK 0.5 billion (53.0%) compared to 2020. The net assets of other funds increased by HRK 0.8 billion, or 60.5%, compared to the previous year. The lowest growth in net assets on an annual level was achieved by feeder funds (which are a relatively new concept in the Croatian market) in the amount of HRK 0.4 billion (276.8%). The growth of the fund's net assets is explained by positive developments in the markets and the return of investor confidence ("HANFA," 2022, pp. 20-21).
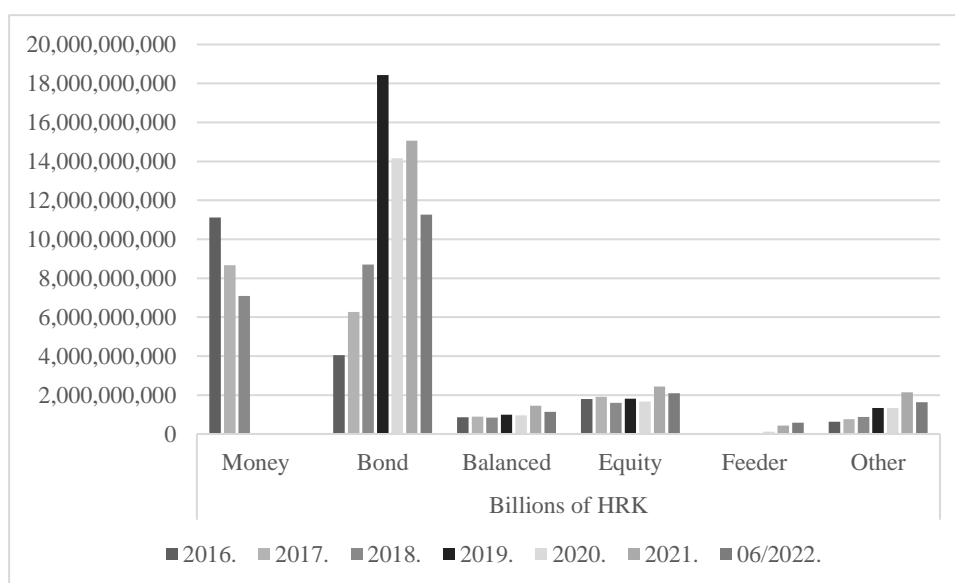
*Figure 1: Movement of the net asset value of open-ended (UCITS) investment funds with
public offering in the period from 2016 to mid-2022
(Source: Compiled by authors according to "HANFA", 2022)*

Figure 1 clearly shows that bond UCITS funds dominate the market in the Republic of Croatia. Until 2019, monetary funds also played a significant role. However, due to the Regulation on money funds' entry into force, most funds were re-registered as short-term bond funds at the beginning of 2019. According to these data, it can be concluded that Croatian investors favor lower risk levels and a more conservative approach to fund management. As for balanced open-end investment funds in the observed period, from April 2017 to the end of March 2022, eight balanced open-end investment funds operated. One of those eight balanced investment funds (HPB Bond Plus) started operating during the observation period, i.e., at the beginning of 2018. The structure of assets by asset type of balanced, open investment funds from 2016 to 2021 is given in Table 2.

Year	2016.	2017.	2018.	2019.	2020.	2021.
Funds	114.196	70.187	94.989	170.954	132.900	254.073
Stocks	254.959	309.063	257.702	221.032	246.464	366.698
Bonds	301.746	379.825	390.711	438.988	432.432	512.892
Investment funds	117.048	127.699	113.786	146.212	154.773	339.341
Money market instruments	26.238	0	0	0	0	0
Deposits	49.514	7.664	27.948	15.459	0	14.502
In total (in thousands of HRK)	863.701	894.438	885.136	992.645	966.569	1.487.506

*Table 2: Movement of the asset structure by asset type of balanced open investment funds in
the period from 2016 to 2021
(Source:Compiled by authors according to "HANFA", 2022, p. 141)*

Table 2 shows that balanced, open investment funds invest most of the collected funds in bonds and shares. They invest smaller amounts in other assets such as cash, shares in investment funds and deposits. As of 2017, balanced investment funds no longer invest in money market instruments, i.e., in treasury and treasury bills. As for the investment structure of the observed funds, it is evident that most balanced investment funds apply the classic investment strategy of the funds collected for balanced funds; that is, they invest primarily in stocks and bonds (up to 60% of the NAV value). Another interesting fact that can be observed is that the net asset value of balanced open-end investment funds in 2021 significantly surpassed its net asset value at the end of 2019. This represents the opposite of the entire market of open-end investment funds and is explained by the desire to achieve higher returns on the part of investors in the period of favorable investment conditions that occurred after the turbulent year 2020.

4. RESEARCH METHODOLOGY

In the analyzed period, from the beginning of April 2017 to the end of March 2022, eight balanced investment funds operated in the market of the Republic of Croatia. Seven funds operated continuously throughout the observation period, while one was established and started operating at the beginning of 2018 (HPB Bond Plus). Seven different management companies managed these balanced UCITS funds. The funds (sub-funds) and the companies that manage them are ZB global, managed by ZB Invest; Eurizon HR Global fund, managed by Eurizon Asset Management Croatia (formerly PBZ Invest); InterCapital Balanced, managed by InterCapital Asset Management; Generali Balanced, managed by Generali Investments, HPB global managed by HPB Invest, OTP balanced managed by OTP Invest, Allianz Portfolio managed by Allianz Invest, HPB Bond Plus managed by HPB Invest. It is important to note that there are other funds on the market of balanced investment funds, but in principle, they are not classified as real balanced funds (balanced funds of funds, balanced conservative funds, other funds). Regarding the investment goals and strategies of the funds, most funds want to realize an increase in the value of assets and shares in the medium to long term (three to five years). All companies actively manage funds following funds' safety, diversity and liquidity to minimize risk. The securities in which companies invest are, in most cases, securities issued by issuers from the Republic of Croatia, the European Union, OECD countries and CEFTA countries. As for the investment strategy itself, most balanced funds invest in equity securities (stocks) and debt securities (bonds). However, the funds also invest in other securities, money and shares in other funds. Most of the funds apply the classic investment strategy of the funds collected for balanced funds, i.e., they invest primarily in stocks (up to 60% of the value of net assets), bonds (up to 60% of the value of net assets) and in shares in other funds, deposits, money and other derivatives (smaller percentage of net asset value). The HPB Bond Plus fund significantly differs from the classic strategy. The HPB Bond Plus fund invests predominantly in bonds and money market instruments, shares in other money and bond funds, and to a lesser extent, in stocks. The funds are intended for investors with at least basic knowledge of investment funds and are considered moderately risky. The analysis of funds is carried out by statistical analysis of the net asset value (NAV) and funds yield or sub-funds. Secondary data collected from the monthly reports of fund operations (issued by the fund management company) for the observed period (five years) are processed using statistical methods of descriptive and inferential statistics. In addition to the statistical analysis, the risk analysis and performance of the funds are also performed. This is done by calculating specific indicators such as Downside Deviation, Sharpe, and Sortino. "Downside deviation is a measure of risk that focuses on returns that fall below the minimum acceptable return (MAR)." (Jahn, 2020). It focuses only on "negative" returns as opposed to standard deviation, which considers all deviations. It better shows how "risky" the investment is. In order to calculate this indicator, it is necessary to determine the minimum acceptable return (MAR). In this analysis, the minimum acceptable return (MAR) is determined as the average of the annual inflation rates of the Republic of Croatia for 2018, 2019, 2020 and 2021 and amounts to 1.75%. It is assumed that investors want to keep the investment amount at least; that is, they do not want inflation to reduce the value of their initial investment. "The Sharpe ratio is the average return achieved above the risk-free rate per unit of volatility or total risk." (Fernando, 2022). It helps investors evaluate the fund's performance concerning the risk taken. A Sharpe ratio of greater than one is considered good, more significant than two is considered very good, while a Sharpe ratio of 3 or more is considered excellent. The calculation of the Sharpe ratio requires a risk-free interest rate. In this analysis, the risk-free interest rate is obtained as the average interest rate on Croatian treasury bills with a maturity of 12 months. The average is calculated for the Republic of Croatia treasury bills issued from April 2017 to March 2022. The calculation gives the amount of 0.3004%. Interest rates on Croatian treasury bills are available on the CNB website.

Treasury bills of the Republic of Croatia are taken because they are issued for a short term (up to a year) and are generally considered the least risky securities. "The Sortino ratio is just a variation of the Sharpe ratio. It uses the lower deviation instead of the standard deviation. The Sortino ratio uses the return of the portfolio from which it subtracts the risk-free rate and divides the resulting amount by the value of the lower deviation." (Kenton, 2020). It focuses on the negative deviation and better represents the performance of the portfolio, i.e., the level of risk for investors.

5. RESEARCH RESULTS

The period from the beginning of 2017 to April 2022 for the Republic of Croatia represents strong economic growth and the final recovery from the last major economic crisis (the great recession of 2008/2009). The business of open investment funds with a public offering has primarily followed the economy's recovery in the Republic of Croatia. This is understandable since ordinary and small investors had surplus funds at their disposal, which they could further invest in investment funds. The business of balanced funds and their yields were extremely strongly affected by the COVID-19 crisis, initially in the form of a substantial drop in yields at the beginning of 2020 due to uncertainty and later in a strong growth that arose as a result of favorable market conditions. These positive conditions on the market appeared as a result of adequate reactions of the EU, the state and regulators. The business of balanced investment funds was strongly affected (in a negative sense) by the beginning of the conflict in Ukraine. Table 3 shows the descriptive statistics of returns of balanced (UCITS) investment funds from April 2017 to March 2022.

Mean	**0,16%**
Standard Error	0,22%
Median	**0,46%**
Mode	**/**
Standard Deviation	**1,71%**
Sample Variance	0,000292627
Kurtosis	6,9365
Skewness	**-1,7439**
Range	11,46%
Minimum	**-7,75%**
Maximum	**3,72%**
Sum	9,75%
Count	60
Confidence Level(95,0%)	0,00441904
Coefficient of variation	**10,53%**

Table 3: Descriptive statistics of returns of balanced (UCITS) investment funds in the observed period
(Source: Compiled by authors based on data from Hrportfolio)

These values can be seen as the monthly average of the sector of balanced (UCITS) investment funds in the observed period. From the table, it can be concluded that the average yield of balanced investment funds in the observed period was 0.16%. The arithmetic mean (average) is less than the median, which is 0.46%, which indicates a negatively asymmetric distribution. This is also confirmed by the asymmetry in the amount of -1.7439. In the observed period, 50% of the returns were lower than 0.46%, while 50% were higher than that amount. The standard deviation, that is, the average deviation from the average in absolute terms, is 1.71%. The coefficient of variation, the average deviation from the average in a relative amount, is 10.53%.

A slight standard deviation and coefficient of variation indicate fewer oscillations of the observed sector's yield. The results are positive if you look at the average of the entire sector. The result is not bad if you consider the crises that hit the world in the observed period. If the results of individual balanced (UCITS) investment funds are observed, the Eurizon HR Global fund achieves the best results. On average, it achieved the highest yield in the observed period (0.34%), while its median was 0.47%, which is higher than the sector average. It has a slightly higher standard deviation than the sector average, 2.12%, but at the same time, it has a lower coefficient of variation, 6.22%. This means that his returns were mainly around the average. Next, in terms of business performance, with an average yield of 0.32%, is the HPB Global fund. It also achieves better results than the sector, although its standard deviation is slightly higher than the average (2.45%). A median of 0.63% and a coefficient of variation of 7.64% indicate a better than sector average performance. After the HPB Global fund, the InterCapital Balanced sub-fund follows in terms of average returns. The average return on a monthly level is 0.31%, while its median is 0.42% lower than the sector average. The standard deviation in the amount of 2.05% and the coefficient of variation in the amount of 6.55% indicate lower volatility of the returns of the sub-fund. Better returns than the sector (in the amount of 0.22%) are achieved only by the Allianz Portfolio fund. The standard deviation in the amount of 1.76% and the coefficient of variation in the amount of 7.85% indicate the lower volatility of the fund's yield. Other funds achieve worse results than the sector average. The HPB Bond Plus fund achieves worse results than other funds due to its more conservative structure and investment strategy. The OTP balanced fund achieves the worst and only negative result. The OTP balanced fund was the only one to achieve average negative returns of -0.14%, and its median is -0.34%. The impact of the COVID-19 crisis is best illustrated by figure 2, which shows the movement of yields of balanced (UCITS) investment funds in the period from April 2017 to March 2022.
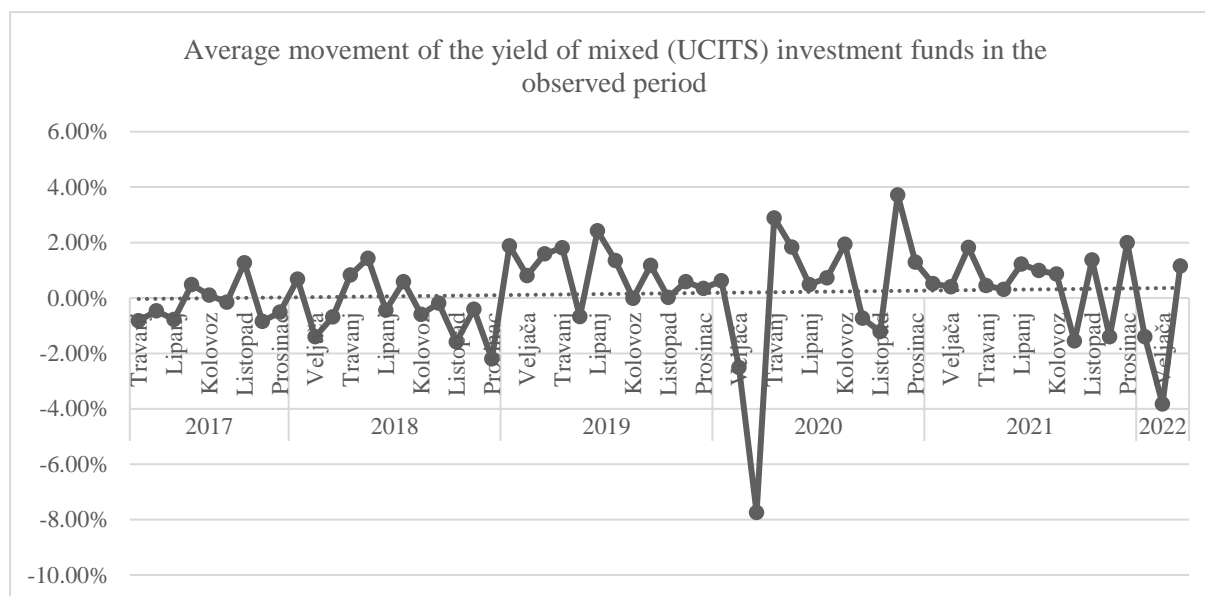

Figure 2: movement of the yield of balanced (UCITS) investment funds in the period from April 2017 to March 2022.
(Source: Compiled by authors based on data from Hrportfolio)

The figure clearly shows that the returns of all balanced (UCITS) investment funds fell significantly in March 2020 when the global pandemic of COVID-19 was declared. The average yield of the entire sector in March 2020 is -7.75%. A favorable period for investing follows immediately from April of the same year and lasts until the end of 2021.

At the beginning of 2022, another worse result of the sector's yield is recorded at -3.83%, which occurs as a result of the outbreak of war in Ukraine. In order to best compare the operations of balanced (UCITS) investment funds, it is necessary to look at the results of the risk analysis, i.e., a measure of business performance of all observed funds. First, an average of performance indicators, i.e., risk indicators of the entire sector of balanced investment funds, was made, shown in table 4.

Downside Deviation	1,37%
Sharpe omjer	0,0804
Sortino omjer	0,1003

*Table 4: Risk indicators of balanced (UCITS) investment funds
(Source: Compiled by authors based on data from Hrportfolio)*

The lower deviation must be a smaller amount than the standard deviation. The Downside Deviation is 1.37%, which is less than the 1.71% standard deviation of the sector. A smaller amount of the lower deviation means a lower investment risk. The Sharpe ratio is 0.0804, while the Sortino ratio is 0.1003. The results of the Sharpe and Sortino ratios are positive, which means that the sector performed successfully in the observed period. Under the given conditions, the sector of balanced investment funds achieved a positive result. The Eurizon HR Global fund achieves the best performance and risk indicators results. Although it has a slightly higher lower deviation than the sector average (1.53%), the amount of Sharpe (0.1490) and Sortino (0.2068) ratios are the highest among the observed funds. The Eurizon HR Global fund is immediately followed by the InterCapital Balanced and HPB Global funds. The lower deviation of the InterCapital Balanced sub-fund in the amount of 1.51% is slightly higher than the sector average. The Sharpe ratio amount is 0.1405, the Sortino ratio amount is 0.1908, and both are higher than the sector average. The HPB Global fund's floor deviation is 1.90%, much higher than the sector average. Its Sharpe ratio is 0.1207, while its Sortino ratio is 0.1551, and both are higher than the sector average. The only fund that still has better results than the sector average is the Allianz Portfolio fund. Its lower deviation is 1.44%, which is slightly higher than the average of the sector. His Shrape ratio is 0.1132, while his Sortino ratio is 0.1377. Other funds achieve results worse than the sector average. This is understandable for the HPB Bond Plus fund since it has a more conservative asset structure and investment strategy. The OTP balanced fund is the only one with a negative Sharpe and Sortino ratio since the monthly risk-free interest rate is higher than the average returns the fund achieves; that is, the average monthly returns of the OTP balanced fund are negative. The COVID-19 pandemic and the start of the war in Ukraine had a negative impact on performance measures, i.e., risk indicators of balanced investment funds on the market of the Republic of Croatia.

6. CONCLUSION
Investment funds, pension funds, and insurance companies represent the most important institutional investors and intermediaries in the capital markets. Lately, balanced (UCITS) investment funds are becoming more and more attractive to small investors in the Croatian capital market. The reason for this is the higher yields they achieve (compared to bond funds) and the greater security they provide to investors (compared to equity funds), but also the increasing financial literacy of citizens. Based on the analysis of the performance of balanced investment funds in the Republic of Croatia from April 2017 to March 2022, it is concluded that they operated successfully. Most of the funds increased their net asset value in the observed period. Only one of the eight observed funds (OTP balanced) achieved a negative average monthly return. Also, only that fund had a negative Sharpe and Sortino ratio. This is understandable since it was the only one with negative average monthly returns.

Other funds achieved positive average monthly returns. The results of business performance and risk indicators were also positive for them. Eurizon HR Global, IntercCapital Balanced and HPB Global funds achieved the best performance indicators and risk analysis results. As for the impact of the COVID-19 pandemic on the operations of balanced investment funds, all funds recorded a substantial decline in net asset value and yield in March 2020. However, their recovery began already in April of the same year. The favorable period for the fund industry that began in April 2020 is the result of correct initiatives by the fiscal and monetary authorities at the EU and state level and regulators. That favorable investment period lasted until the end of 2021. Finally, it is concluded that balanced investment funds performed successfully from April 2017 to March 2022 despite the great fear and uncertainty caused by the global CVOID-19 pandemic.

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MAIN ELEMENTS OF THE CHANGE MANAGEMENT MODEL FOR SMES IN THE REPUBLIC OF MOLDOVA: THE NEED FOR UPDATED IN THE CONDITIONS OF INDUSTRIALIZATION 4.0

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ABSTRACT

Modern changes in the functioning environment, caused by the provocations of the Fourth Industrial Revolution, have cast doubt on the entire management system of a modern enterprise. New technologies invariably lead to a change in the management model. According to many scientists (Klaus Schwab, Thomas Siebel, Ray Kurzweil) "the world will never be the same". Therefore, approaches to management must also change. Models that have been successfully functioning until recently have become ineffective in today's environment. Small and medium enterprises in the Republic of Moldova are in a difficult situation. The situation may worsen if serious measures are not taken to adapt companies to the conditions of digital transformations. In management theory, there are many models of change that help to make the transition to the desired state of the system. The purpose of this study is to substantiate the organizational change model for SMEs in Moldova: to analyze the current state of the elements of the model and consider the necessary transformations that will correspond to an effective functioning model in the future. This model should take into account the characteristics of the sector of small and medium-sized enterprises, their vulnerability and weak sustainability, at the same time, the advantages that they have: flexibility, adaptability, innovation. To clarify the problems and directions of development, a sociological study was conducted among the personnel of enterprises.
Keywords: *business processes, changes, change model, Industrialization 4.0, organizational structure, personnel, teams, transition, leadership*

1. INTRODUCTION

The topic of business model transformation is gaining momentum in today's world. It becomes clear to companies that it is impossible to work in the old way in the new conditions. Simultaneously with the concept of the Fourth Industrial Revolution, proclaimed by Klaus Schwab in 2011 at the World Economic Forum in Davos, a new trend began to develop in management, which can be seen as the direction of change and innovation management, associated with a fundamental restructuring of the business model. The surge of interest was based on the phenomenal success of companies that organized business in a completely new way, taking into account modern technologies, but at the same time, they pushed off the stereotypes of the classical business model. We are talking about companies such as Uber, Lyft, Airbnb, Amazon, Netflix, Aetna, Schindler, 7-Eleven Japan and others whose business models are of interest to this study. In addition to the increased interest in transformations of business models, this study focuses on the sector of small and medium-sized enterprises (SMEs) of the Republic of Moldova, which represent the vast majority in terms of the number of economic agents (98.4% of the total number of Moldova entities).

1.1. Problem Statement

The changes associated with the processes caused by Industrialization 4.0 may have an ambiguous effect on this sector, since it seems that absolutely all business entities will be involved in the process, and not only. Changes affect everything, up to the personality of a person and his life.

The crisis situation in this sector has been exacerbated by many reasons, including the quarantine associated with the Covid-19 virus and the political instability of the region. In addition, given the specifics of SMEs, the difficulties of the behavior of transformational changes in this particular sector also seem obvious. Often, the lack of financial capacity, of specialists, of a clear vision, development strategy and the lack of professionalism of managers ultimately expose companies to bankruptcy and liquidation.

1.2. Aims of the Research

Therefore, the purpose of our study is to clarify the main components of the change model for Moldovan SMEs. This goal is specified by the following tasks: substantiate the main conceptual aspects related to transformation processes, the Fourth Industrial Revolution and change management; identify the features of the main changes associated with Industrialization 4.0; clarify the main elements and features of existing SME business models; identify the main problems in the functioning of SMEs in the Republic of Moldova that impede the implementation of transformations; substantiate recommendations for changes, clarify the main aspects of the organizational change management model, substantiate the vision of the future model that will function in difficult and unpredictable conditions.

1.3. Research Methods

This study is part of a study funded from the state budget of the Republic of Moldova on the topic: "Creating the organizational change management model for small and medium enterprises through the challenges of Industrialization 4.0", within the framework of the project numbered 22.00208.0807.10/PD. *The research methods are*: analysis and synthesis of scientific sources, concepts and approaches to change management, Industrialization 4.0, models and innovations. In addition, an analysis of statistical data was carried out to establish trends, dependencies that determine general patterns. The research methodology also includes the development of a questionnaire based on one's own vision of the research problem. Further, the study itself was carried out, in which employees of selected SMEs (46 enterprises) expressed their opinion on their own understanding of the problem. Justification of the problem and conclusions are the final stage of this study. *Limitations of the study:* The limitation lies in the impossibility to cover all SMEs or most of them in one study. To develop the methodology, the author used a large amount of scientific and practical literature, as well as a large number of statistical sources. The study was conducted within a limited time frame - the period of January-February 2022 to obtain primary information regarding the state of the object of study, substantiate the conclusions and ways to develop further research.

2. REVIEW OF SCIENTIFIC APPROACHES TO TRANSFORMATION

For a detailed study of the chosen topic, it is necessary to divide the conceptual part into several components: firstly, the trends of the Fourth Industrial Revolution, under the influence of which changes in management models occur. Secondly, the changes taking place in management, in particular, in change management. Thirdly, to explore the notion of a business model that companies should strive for if they want to survive in the future, and fourthly, to justify a transition model that could bring about transformation.

2.1. The Fourth Industrial Revolution and technologies transforming the world

Over the past 250 years there has been a significant shift in the entire world order. Since the beginning of the First Industrial Revolution, the average real income per capita in countries that are members of the Organization for Economic Co-operation and Development (OECD), has increased by 2900%, life expectancy has more than doubled in most countries, from 40 to over 80 in the UK and from 23.5 to 65 in India. (Shwab, 2016).

Let's take a closer look at its predecessors of the Fourth Industrial Revolution, using a detailed description of the waves of digital transformation by the famous entrepreneur and inventor Thomas M. Siebel. Siebel practically identifies Industrialization 4.0 with digital transformation (Siebel, 2019), his concept is similar to the theory of well-known researchers Andrew McAffe and Eric Brynjolfsson, who call today's era the "age of machines" (McAffe, Brynjolfsson, 2017). Thus, the revolutionary processes associated with digital transformation were preceded by two waves of digital innovation. According to the author, the first wave, called digitalization, goes back to the 1980s. (recall that since the 1950s, the use of computers has been centralized), and is associated with the advent of personal computers, which increased the efficiency of both individual employees and companies as a whole, provided flexibility in work schedules and facilitated calculations, and also helped store large amounts of data. Manual labor associated with calculations, processing, control and data storage has been improved thanks to the use of technology, and labor productivity has increased manifold. This period accounts for a significant jump in global economic growth of about 38%. The scientist associates the second wave with the advent of the Internet in 1989 and is associated with the name of Tim Berners-Lee, who developed a set of protocols that allow parts of content to communicate with each other, thus he embodied the concept of hypertext, which was first described back in 1945 by the scientist Vanivar Bush (McAffe, Brynjolfsson, 2017) As we know, the Internet has quickly penetrated into all spheres of life. And if the first objects (for example, Yahoo!, Netscape) were mostly static pages intended to be read, then already in the early 2000s, Web 2.0 technology appeared, which gave impetus to the development of social networks, virtual messaging, blogs, and the emergence of many platforms. Already during this period, firms focusing their developments on digital technologies received a huge advantage. Accounting and management programs began to be introduced everywhere, which improved both communication within companies and with external partners, using CRM systems (Siebel, 2019). As we can see, the two waves of digitalization described above did not completely replace work processes, but significantly transformed them, which affected both the lives of individuals and companies and relationship systems. These two waves were the basis for today's transformations, which involve a transition to a significantly different level of society based on the use of artificial intelligence (AI) in all areas of human life and activity, the use of the Internet of things (IoT), as well as cloud computing and big data arrays (big data), which are invariably associated with a change in people's thinking and lifestyle.

2.2. Transformation in management – today's provocations.
Today, a large number of areas stand out in management science, many of which are an improved version of previous approaches. The science of management began to use and generate new directions more intensively in the period after the Second World War. This was due to the acceleration of change and the increasing complexity of the external environment. During this period, models and methods of quantitative analysis begin to be applied in decision-making: forecasting, modeling, linear and non-linear programming, information technologies and information systems in management began to play an important role. Thus, management gradually approached new concepts, principles and models that characterize the latest trends emerging in the business world, and in society as a whole, namely, the changes associated with the Fourth Industrial Revolution, which radically change the system of relationships between organizations and between employees within the organization. Changes caused by revolutionary technologies necessitate the development of new approaches to management and change management. Conducting the concept of organizational development through the prism of transformational changes associated with the Fourth Industrial Revolution, we note that most researchers focus on the essence and depth of the ongoing changes, as well as breakthrough technologies, believing that the very understanding of organizational development does not

change, but the essence of transformations changes. In our opinion, the definition of modern organizational development, viewed through the prism of Industrialization 4.0, differs from the traditional one: - short-term forecasts, - variability of change programs, - as well as their constancy, so that the end of one program may mean the beginning of another, in addition, one enterprise can implement several change programs at the same time, given the principle of consistency, which assumes that a change in one component of the system will certainly affect the rest. In this sense, contrary to the opinion of the classics of the concept of organizational development, we note that, in fact, development can be both spontaneous and unstructured. But, in this sense, the organization, without carrying out any planned activities, will not be able to be stable and comply with the principle of survival, that is, it will soon cease to exist. So, in contrast to the classical understanding of sustainable development, the modern understanding characterizes the constancy of change more than long-term planning, with the obligatory consideration of cultural changes and a focus on excellence.

2.3. Change Management Models: New Orientations
Change management is a special type of management that aims to achieve tangible results, both in the short and long term, as well as timely adaptation of the company to market requirements. This is a relatively new direction in management theory, the emergence of which is due to many reasons: the rapid dynamism of changes occurring in the external environment, the ever-increasing level of computerization of society and the globalization of the economy. In addition, one of the factors that dominantly affect the formation of change management is the change in the consciousness of mankind, a revision of values and, above all, a change in managerial thinking. According to the American guru of management R. Daft, internal and external forces are a source for the implementation of changes. R. Daft states that "changes can and must be managed", in addition, the researcher is convinced that: "the blame for the inability to predict new trends or adapt to them rests only with management"(Daft R., 2015). Asking a question about the modern model of change, let's take a short digression into the history of change management. Usually, the history of change management is associated with the name of Kurt Lewin. Thus, beginning in the 1950s, approaches and models began to rapidly develop to help overcome resistance and introduce changes.

Table following on the next page

Year	Author	Main contribution
1951	Kurt Lewin	presents the main mechanisms of change management: Unfreezing is a violation of the stable equilibrium that supports existing behaviors and attitudes. Change is the development of new responses based on new information. Refreezing is the stabilization of changes and a new balance.
1968	P. Drucker	"The Age of Discontinuity: Landmarks for Our Changing Society": Changes disrupt the continuity of our lives and business environments, making predictions that extrapolate from the ineffective past and thus require new models to predict the future.
1969	M. Beckhard	developed a change program consisting of the following processes: establishing objectives and determining future conditions; the diagnosis of existing conditions in relation to these objectives; the development of transitional actions and the creation of the necessary commitment for the realization of the future state; developing strategies and action plan.
1970	A. Toffler	"Future Shock": With new generations, the lifespan of social and technological norms is decreasing. The ability of a society to cope with changes such as the Industrial Revolution at a much faster rate than the rate of change in the past becomes questionable.
The 70s of the XX century	L. Greiner	One of the most widespread and successfully implemented in practice is a six-stage system: pressure and motivation; mediation and redirection of attention; problem diagnosis and awareness; finding an appropriate (new) solution and its approval (support) by employees; experimenting and correcting the solution;
1980	Richard Pascal, Anthony Athos	The McKinsey model, proposed by two researchers Richard Pascal from Stanford and Anthony Athos from Harvard and a group of consultants from McKinsey (Robert Waterman, Tom Peter, Julien Phillips). It was named "7S" after the first letters of the elements included in it: strategy, structure, systems, skills, shared values, staff, style.
1995	D. Kotter	A useful model for understanding and managing change. The process of change takes place in several successive stages. Violating this sequence or rejecting any of them leads to the illusion of rapid changes, but removes the desired result.
2012	G. Mintzberg	long-term changes, the so-called deep changes occur with the harmonious internal development of the organization, which is facilitated by the vision of the organization as a community.
Our days	Ichak Adizes	Who will be successful? Someone who adapts to change faster than others. The only way to avoid conflict is to have no problems. But we can't have problems just by stopping the changes - and that can only happen in death.

Table 1: Evolution of change management concepts
(Source: based on source analysis 6-13)

Our task is to identify the main adequate models of change for enterprises that fall under the provocations of the Fourth Industrial Revolution, or Industry 4.0. Obviously, from the basic situations that remain the same as above all resistance to change. In addition, in such models, in our opinion, the decisive role will be played by new technologies, or technologies of the Fourth Industrial Revolution, as their possibility K. Schwab. According to Peter Weill and Stephanie Woerner, "Digital transformation is not about technology, it's about change," and at the same time, "the need for digital transformation is undeniable, the only question is how and when it will impact" (Weill, Woerner, 2018). In this context, the authors present a tool for creating a new generation model - a conceptual methodology (2x2 digital business model), which, in our opinion, can determine the future direction and SMEs.

So, the model consists of four separate business models, each of which represents different possibilities and options for averaged financial indicators:

1) Supplier: A company that is a manufacturer that sells its product through other companies.
2) Omnichannel: An integrated value chain that creates a multi-product, multi-channel customer experience according to customer life events.
3) Modular manufacturer: a provider of products or services that are ready to use.
4) Ecosystem Driver: The organizer of a coordinated network of companies, devices and customers with the goal of creating value for all involved.

To determine your niche and the direction of the company's development, it is necessary to answer the following questions:

*   To what extent the company is part of a value chain that can be controlled, go to what extent they are part of a more complex digital ecosystem;
*   It is necessary to find out the degree of awareness of the needs of end customers (full or partial). Note that a company at the moment can be in one quadrant, and at the same time, focus on the quadrant corresponding to a greater competitive advantage. for example, retail SMEs move from the Omnichannel quadrant to the Ecosystem driver.
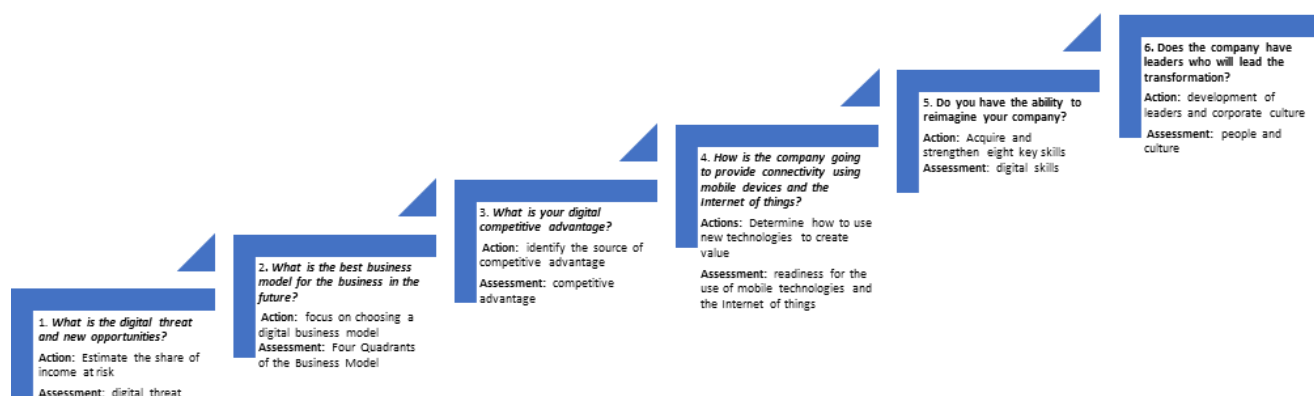

Figure 1: Six questions (stages) for digital transformation of a business model
(Source: adapted by the author by P.Weill and St.L.Woerner,2018)

Figure 1 presents six questions that can be compared to the six stages of the transformation process in today's environment. In addition, eight skills for digital transformation are of interest for research, which scientists divide into skills to move up the digital model building scheme and skills to move to the right in the digital business model building scheme, that is, skills that contribute to gaining a greater competitive advantage. Table 2 presents the skills needed to transform models presents the skills needed to transform models.

Skills to Move Up the Digital Modeling Scheme	Skills to Move Right on the Digital Business Model Scheme
1. Collection and use of complete information about customers	5. Acquisition of distinctive properties and a place that customers remember when the need arises
2. Expanding the influence of the client on the company	6.Identification and development of partnerships
3.Creating a Culture of Fact-Based Decision Making	7.Better service delivery with a user-friendly interface
4. Delivering an integrated, multi-product, multi-channel customer experience	8. Development of efficiency, compliance with the law and safety as competencies

Table 2: Required Skills to Advance the Business Model Scheme
*(Source: adapted by the author by P.Weill and St.L.Woerner,2018)*

So, the main conclusion of this chapter is the understanding that the models of change that are still in effect (the Model of Kurt Lewin, Kotter, the McKinsey 7S Model and others) are also important for research, for example, the force field model is a methodology for determining the forces of assistance and counteraction forces, and today, when conducting diagnostics, they are quite successfully used, taking into account, of course, new factors. Also, the Kotter model, representing a certain sequence of steps, is important to apply, but again, given the updated circumstances. Model 7S, in our opinion, needs to be supplemented with a new element that is relevant in modern conditions and is the engine of all changes - this is technology. At the same time, models associated with digital transformation are acquiring fundamentally new features: customer orientation, in particular, the inclusion of customers in the value chain, or in their eco-system, and secondly, changing the system of relationships with partners who, ideally, they also become part of the ecosystem; thirdly, the development of a new type of business model focused on the use of technologies that radically change the entire environment of the company's functioning (3D printing, artificial intelligence, robots, Internet services, etc.)

3. TRANSFORMATION OF SME MODELS IN THE REPUBLIC OF MOLDOVA: SITUATION ANALYSIS

In order to identify the main trends in the development of objects of the national economy, we conducted an empirical study in which managers and employees of enterprises who showed a willingness to participate in the study took part.

3.1. Assessing the importance of SMEs to digital transformation

In our opinion, understanding by the staff of the importance of ongoing processes is necessary for carrying out transformations. Answering the question about the importance of adapting to the digitalization process and related changes (the assessment took place on a 10-point scale), the answers were distributed as follows (Figure 2):
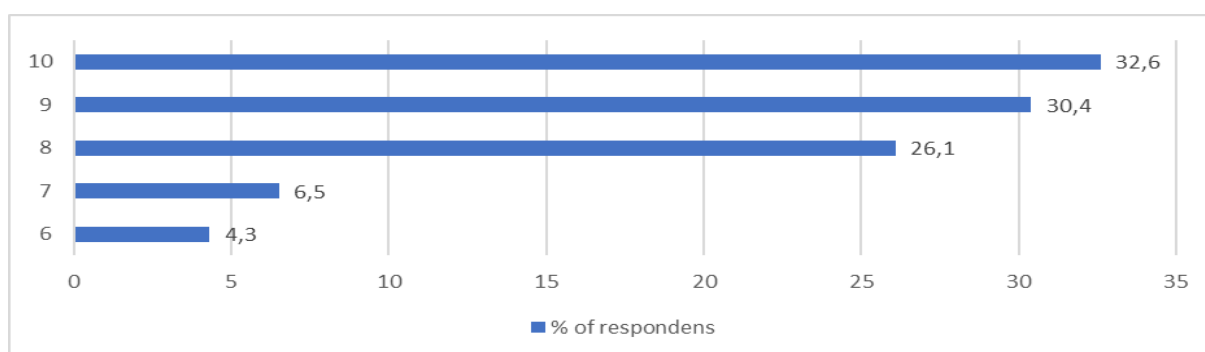
Figure 2: The importance of adapting enterprises to the digitalization process according to respondents (on a 10-point scale)
(Source: study results)

It follows from the results that the largest percentage of respondents (32.6%) evaluates adaptation to digitalization in the highest way, that is, by 10 points, followed in descending order by 9 points - 30.4%, 8 - 26.1%, very small the percentage of respondents assess this need in accordance with the gradation of 7 and 6 points, which indicates an understanding of the urgent need for such changes by the majority of respondents. In continuation of the study, respondents assessed whether the process of digital transformation will affect all SMEs, to which the answers were divided as follows: 73.9% answered in the affirmative, respectively 26.1% - negatively. Regarding whether digital transformation will bring benefits to enterprises, 93.5% of respondents answered in the affirmative.
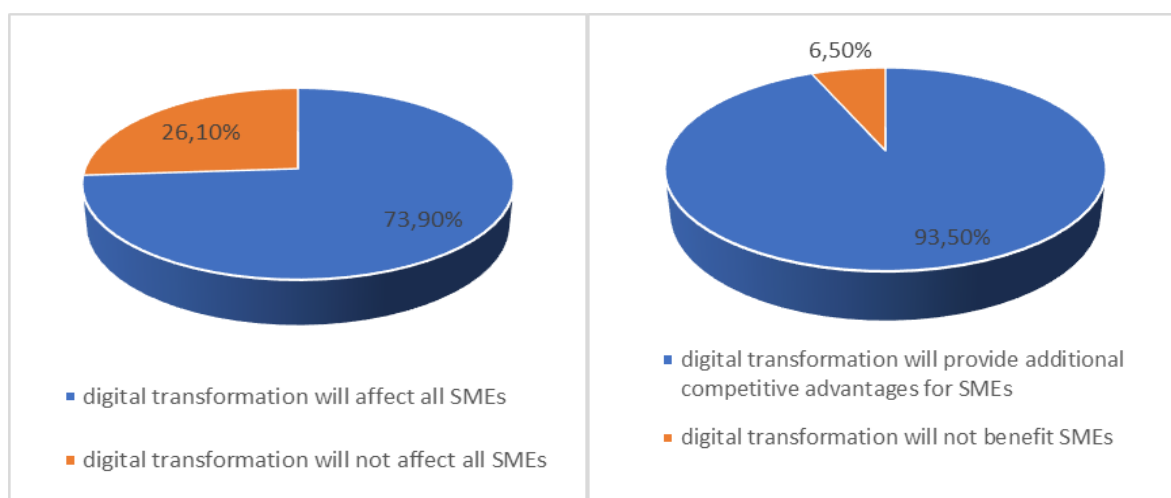
Figure 3: Prospects related to the digital transformation of SMEs (according to respondents)
Fig.3.1. Will the digital transformation affect all SMEs in the Republic of Moldova
Fig.3.2. Will digital transformation provide additional competitive advantages for SMEs in the Republic of Moldova
(Source: study results)

Continuing the question about the benefits that the digital transformation of SMEs in the Republic of Moldova represents, the respondents who answered yes to the previous question noted, in terms of importance, the possible benefits that SMEs will receive.
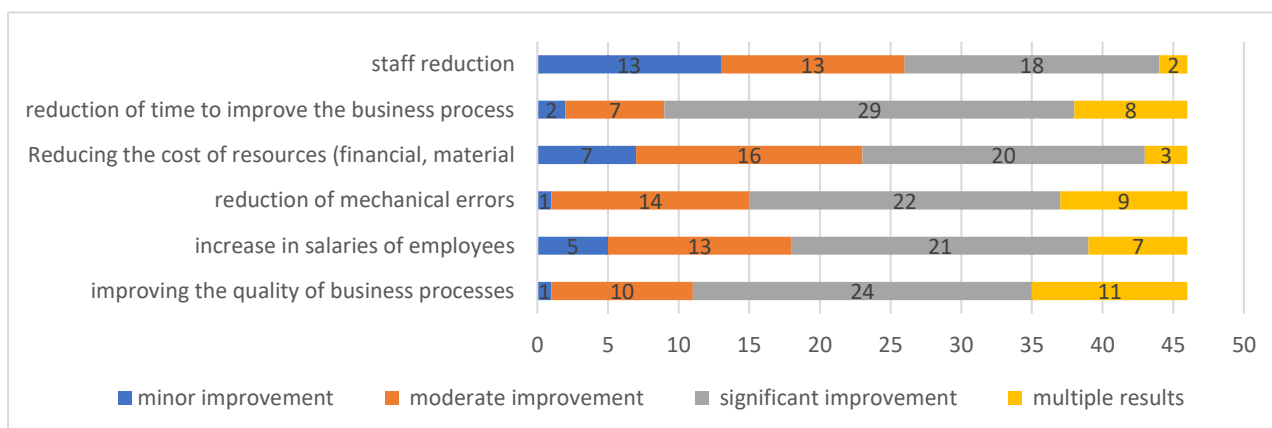

Figure 4: Key benefits/changes for SMEs associated with the digital transformation process
(according to respondents)
(Source: study results)

As can be seen from Figure 4, respondents consider the improvement in the quality of business processes, the reduction of mechanical errors in the process of work and the reduction of time for the implementation of business processes to be the main benefits of transformation, employees consider the increase in wages and reduction in costs (financial, material, etc.) Such responses may be due to a lack of understanding (not in all but many cases) of the process of transformational change, which naturally involves cost reduction. At the same time, this answer can also be explained by the fact that when introducing the latest technologies, an enterprise will have to make significant expenditures on infrastructure, intangible assets (patents, licenses), retraining of personnel is possible, as well as on the creation of an information security system.

3.2. Directions for digital transformation of SMEs in the Republic of Moldova
Since 2005, initiatives related to digital transformation have been supported in the Republic of Moldova. This year, the National Strategy for the Creation of the Information Society - "Electronic Moldova" was adopted, the main goal of which was to develop infrastructure and achieve a level "which will ensure equal access to information resources for all categories of citizens"[15]. In 2013, the next large-scale National Strategy for the Development of the Information Society "Digital Moldova 2020" was adopted. The strategy provides the main indicators of development in the field of digitalization of the country:

- IDI index - international rating of the level of development - 62nd place among 155 countries (4th place among the CIS countries),
- The e-GRI index – which identifies the level of development of e-governance – is 69th among 159 countries, moving up 11 positions compared to 2010, but at the same time, it ranks last among the countries of Eastern Europe.
- The KEI Index, which characterizes the level of Internet penetration in schools (According to the Global Competitiveness Report for 2012-2013) - 61st place among 144 countries.
- The NRI Index - which assesses the level of network readiness - ranks 78th out of 142 countries.

That is, the state of development indices in this area for 2013 characterized the situation, far from leadership, but suggesting prospects in this direction, which were presented in the main guidelines of the Strategy. Also, in this and closely related areas, many programs and strategies have been developed, including:

- The eTransformation program, adopted in 2011,
- Strategies for the development of the IT industry ecosystem and digital innovations for 2018-2023 aimed at increasing the competitiveness of the ICT industry at the regional level
- The Information Security Strategy of the Republic of Moldova 2019–2024, which regulates the principles of organization at the level of the state, society and the individual,
- The National Research and Innovation Program for 2020-2023, which clarifies the research and innovation priorities.

At the end of 2022, a new Digital Transformation Strategy 2023-2030 will be adopted.
Experts identify the following main problems, identified through consultations with stakeholders, that stand in the way of the planned transformations:

- slow growth of innovative companies,
- lack of venture capital, low level of cooperation between enterprises and universities,
- insufficient technological preparation (number and sophistication of 5G routes, auction plans for 5G spectrum, etc.),
- the absence of legislative acts on new digital technologies (such as artificial intelligence, blockchain, IoT, Big Data, mining, etc.), which represents a gap in the legislation for the development and commercialization of these technologies,
- insufficient adaptation of the regulatory framework to digital business models,
- shortage of qualified labor force in industry, central government bodies and especially local public administration bodies,
- low level of digital skills and awareness of the population,
- resistance to changes of civil servants,
- lack of financial resources,
- lack of interconnection and compatibility between disparate IT systems of state institutions, weak IT infrastructure,
- low investment in ICT in agricultural SMEs,

- low involvement of local companies in government-funded projects,
- insufficient motivation of civil servants in the final results;
- insufficient presence of scientific research in the development and monitoring of policies aimed at the development of the information society.

In March 2022, the Decree of the Government of the Republic of Moldova No. 129 of 03/02/2022 was issued on the approval of the Digital Transformation Program for Small and Medium Enterprises. The main guidelines of the program are: Developing the skills of entrepreneurs to plan and implement business practices that contribute to digital transformation (at least 40% of beneficiaries); Providing financial support for the implementation of digital transformation plans (for at least 150 SMEs); Increasing the competitive advantage and client portfolio of SMEs (by at least 20%); Development of e-commerce, reduction of physical currency turnover, development of courier services (for at least 20% of beneficiary companies). Thus, the Digital Transformation Program for SMEs is a set of activities that involves gratuitous financial support aimed at implementing various digital transformation tools (facilitating the transition to e-commerce, purchasing equipment and software in order to introduce innovations and new technologies into the digital transformation process, as well as to eliminate or minimize risks).

4. CONCLUSION

Given the interest in the forthcoming changes and the situation in the external environment of SMEs in the Republic of Moldova, we believe that favorable trends for transformations have emerged. At the same time, it should be noted that an important component of the program should be change management, which includes an organizational change model, and a change program. In turn, the change model should include the following main aspects: the formation of a change team, with clarification of roles and the choice of a change agent, a staff training program with clarification of the basic skills demanded in the new conditions, description of new technologies corresponding to Industrialization 4.0, elements of corporate culture that promote change, updated business processes and stages of their restructuring, a concept diagram of updated relationships in the process of transforming a business model, an updated system of motivation that would contribute to the formation of learning organizations, a transformation of the control system that will logically proceed from the functioning of new technologies, the establishment of new planning principles that will include the vision of the organization and the principles of further adaptation, a certain type of leadership that supports change. In addition, the development of a vision for a new business model in response to the six main questions described in this article and the definition of a new business model that will be consistent with the value orientations of the company. The program of changes, of course, should also include a financial plan that includes a description of all the expected items of expenditure and income, the expected risks and opportunities. Obviously. that government programs are a serious support for SMEs, which are almost impossible to implement a transformation program on their own.

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SOCIAL STATUS AND PROSPERITY - THE EUROPEAN CONTEXT OF SUSTAINABLE DEVELOPMENT

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ABSTRACT
The paper provides an analysis on the subjective well-being as a topic of growing interest in making international comparisons that allow us to define the macroeconomic and social factors that determine well-being and the policies that affect it most. In this particular study, we aim to explore the relationship between social status and the various measures of well-being, without distinguishing between the subjective (hedonistic) and the objective (eudemonic) perception of well-being. Based on the results for Bulgaria and other countries from the Balkan region of European Social Survey (ESS 9) on inequalities and well-being we have identified a number of key findings on the engines of prosperity and social sustainability. We discuss the state of well-being and its national specific level and features as well as its regional peculiarities in order to present adequately the subjective assessment of well-being in terms of all the problem areas of the socio-economic and environmental living conditions and livelihoods of people. Bulgaria is the poorest country is the European Union. Nearly 40% of the population lives at risk of poverty and social exclusion. This requires awareness of the impact of personal financial, employment and educational status (in short - social status) on our lives and what is the relationship with the perception of personal and / or social well-being. On the other hand, questions about what subjective well-being is, how to measure it, and how to improve it are important not only for researchers but also for governments. Based on data from ESS 9, an analysis is made of the main factors influencing the perception of well-being in Bulgaria, comparing the data with the average levels for European countries, with an emphasis on the countries of the Balkan region. Relevant conclusions have been drawn and economic policy recommendations have been proposed.
Keywords: *welfare, well-being, government policy provision and effects of welfare programs, European integration*

1. MOTIVATION OF THE STUDY
Bulgaria is the poorest country in the European Union. Nearly 40% of the population lives at risk of poverty and social exclusion. This requires awareness of the impact that personal, financial, work and educational status (in short - social status) has on our lives and how it relates to the perception of personal and/or societal well-being. The questions of what subjective well-being is, how to measure it, and how to improve it are not only of concern to researchers but should also be an integral part of any management program. In this regard, cross-national surveys, such as the European Social Survey (ESS), provide the necessary comparative data on public attitudes and behavior and thus play an important role in answering these questions. The goal of any democratically elected government is to ensure the highest level of prosperity within the economic means of society. Too often, however, governments limit themselves to maximizing economic growth rather than directly focusing on achieving prosperity.

It can definitely be said that although there is a relationship, it is not as strong as it is supposed to be. In fact, there is every reason to argue that there is a confusion of goals with the means to achieve them, and we continue to delude ourselves that good macroeconomic indicators (and especially high economic growth) are a sufficient condition for economic prosperity. If we analyze deeply, we will understand that in fact the high and stable economic growth is not a goal, but only a means to achieve goals of a higher rank: a better standard and quality of life, which includes a tangible improvement in each of the spheres of healthcare, education, culture, social and legal protection, real participation in public life, etc. In practice, this means that instead of focusing solely on economic growth, policymakers must look directly at the bottom line - human well-being. Focusing policy on subjective well-being has a number of advantages. Research shows that better well-being contributes to many other important outcomes. Encouragingly, in recent years there has been increasing recognition of the need to look beyond GDP and focus on well-being. Major advances in well-being research in recent years have been made possible by the growing amount of data available. Surveys such as European Social Survey (ESS) are central to the measurement of well-being.

The data they provide about individuals' experiences can be used to highlight:
- Different dimensions of well-being;
- The engines of prosperity;
- How wealth is distributed among different population groups.

There is a growing interest in making international comparisons that enable the examination of the macroeconomic and social factors that determine well-being and the policies that affect it most. In recent years, research has established a number of key findings about the drivers of well-being, and it is imperative that policymakers begin to propose appropriate policies to improve it. This necessitates deepening the studies and accumulating reliable data on how people evaluate and experience their lives. In this particular study, we seek to explore not so much the philosophical side of the issue, but rather the interrelationships between social status and various measures of well-being, without distinguishing between subjective (hedonic) and objective (eudemonic) perceptions of well-being.

2. THEORETICAL FOUNDATIONS
Well-being should be understood as a dynamic process that gives people a sense of how they live their lives, taking into account the interaction between different circumstances, activities and psychological resources. Until recently, prioritizing economic growth was thought to be the best way to maximize prosperity. This opinion is increasingly disputed. Studies show that there is a positive relationship between economic growth and well-being, but it is weak, even insignificant, beyond a certain level of wealth and income (Layard, 2005; Bartolini & Bilancini, 2010; Easterlin, 2013). However, the question of what contributes most significantly to well-being remains open. The study of well-being and the accumulation of empirical data have an important role, as this is the way to clarify what are the factors that affect well-being and what should be the policies to maximize it. It should be noted that much progress has been made in this regard and there are now sufficient reliable national data to measure the various aspects of well-being that are collected by official national bodies in many European countries. Of particular note is the module on personal and social well-being, first included in the third wave of the ESS and repeated in the sixth wave. Some of the available studies rely on single measures of happiness or life satisfaction as the sole measure of well-being (Abdallah and Mahony, 2012).

However, a number of other studies, both theoretical (Vittersø, et al., 2010) and empirical (Huppert & So, 2009), argue that well-being is more of a multidimensional concept that should include the following key dimensions:

- Evaluative well-being, which encompasses individuals' overall self-assessments of how well their lives are going, including whether they feel satisfied and/or happy in general;
- Emotional well-being, which implies the presence of positive emotions such as happiness and pleasure and the absence of negative feelings such as anxiety and depression;
- Functional well-being, which includes a sense of autonomy, competence, commitment, meaning and purpose, self-esteem, optimism and resilience;
- Vitality and ability to face challenges calmly;
- Community well-being, which refers to an individual's feelings about the community in which he lives, including trust in other people;
- Supportive relationships, which refers to the feeling that there are people in their lives who offer support, friendship, gratitude, and with whom intimate matters can be discussed.

The search for answers to these questions can be traced back far into the past. Arguments about what constitutes human happiness and well-being have been going on for millennia. The hedonistic school of thought, represented mainly by Aristippus and Epicurus, preached that the highest goal of human life was pleasure. Aristotle rejects this narrow understanding and instead proposes the concept of eudaemonia, requiring people to live in accordance with their true nature.
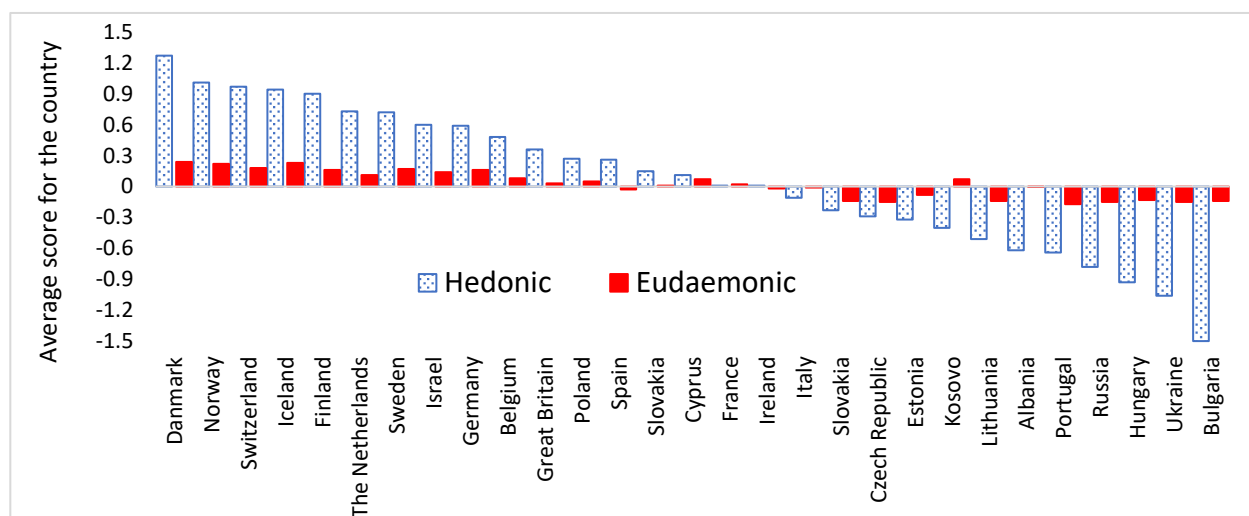

Figure 2: Perception of well-being
(Source: ESS, 6th wave)

Debates about the nature and differences between happiness, eudaimonia, well-being, etc. continue to this day. At the same time, data from previous ESS research shows that there is a strong correlation between the two factors — people who score high on hedonic well-being also tend to score high on eudaemonic well-being. The comparisons also show (Figure 2) that in almost all countries both forms of welfare go in the same direction, i.e. countries that score above average on hedonic well-being also score above average on eudaemonic well-being. The research cited above also suggests that well-being, especially hedonic well-being, varies across countries. For example, hedonic well-being tends to be higher than average in Scandinavia and lower than average in parts of southern and eastern Europe. However, it is important to keep in mind that these country-level findings hide a considerable amount of within-country variation.

The analysis shows that only 15% of the variation in hedonic and 7% of the variation in eudaemonic well-being can be explained at the country level, and the rest is explained by individual differences. Examining how socio-demographic characteristics such as gender, age and education relate to both hedonic and eudaemonic dimensions of well-being can provide useful information for policymakers seeking to understand and address differences in well-being in society. The study of well-being is carried out in two main directions - subjective and objective. An objective approach assesses well-being using quantitative indicators such as income (expenditure) or a multidimensional approach is applied where different measures are combined. The subjective approach focuses on how people feel about their lives in general or about some specific areas of their lives, such as health, work, leisure, finances, environment, etc. It should be noted that until recently (especially among economists) the objective approach dominated. In recent years, however, the subjective approach has been enriched both in terms of theory and accumulated empirical data (e.g. see Di Tella et al. 2001; Easterlin 2003; Graham and Felton 2006; Kenny 2005; Van Praag et al. 2003 d.).

3. VARIABLES INFLUENCING WELL-BEING
3.1. Income
From the many studies conducted in recent years, it can be conclusively established that well-being is mainly influenced by income, health, education, social and professional status. The most controversial question, however, remains whether higher incomes translate directly into happiness and hence prosperity and well-being. If this is the case, it may be possible to estimate exactly how much a household should receive to ensure well-being. What has so far been established beyond dispute is that at any given time rich nations are on average happier than poor nations and at any given time rich people are on average happier than poor ones. However, over time and within a country, happiness does not increase in direct proportion to increases in income. This is an observation that holds true for several transition and developing countries (Easterlin and Angelescu, 2009; Easterlin et al., 2010) and which forms the so-called 'income paradox'. (Lopes et al., 2014). There are a number of reasons (Diener and Biswas-Diener, 2008; Graham et al., 2004) for arguing that happier people earn more (and are healthier) than unhappier people. Previous research has also shown that education reduces the chances of falling into poverty (see for example Ferro Luzzi et al. 2008) as it can provide more job opportunities.
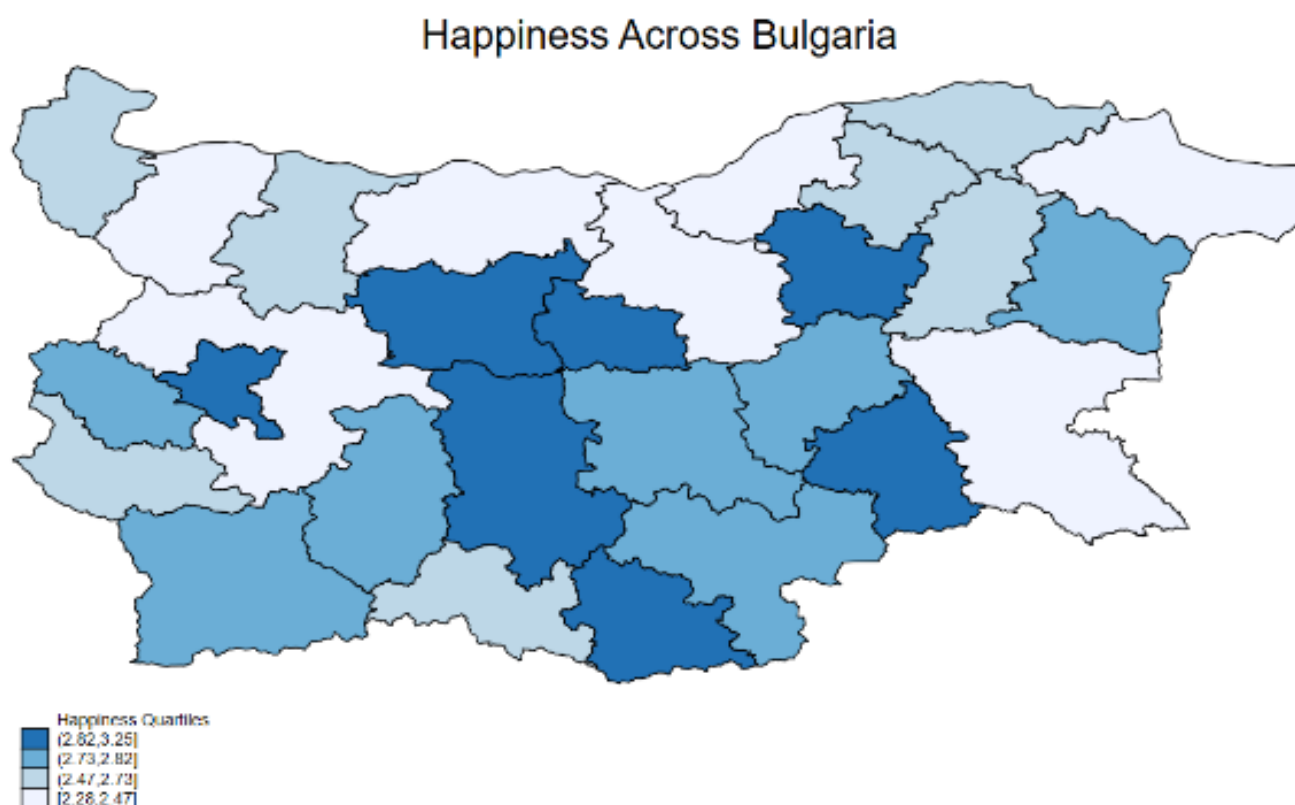
Figure following on the next page

Figure 3: Perception of Happiness in Bulgaria by regions
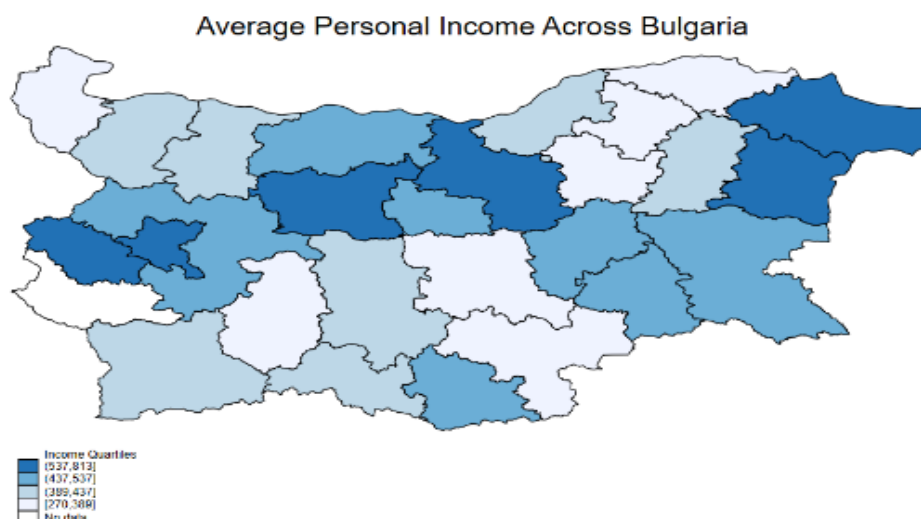*(Source: ESS, 6th wave)*

3.1.1. Differences in the perception of well-being according to income
One way to assess inequality in well-being is to look at the well-being of respondents in different income groups, for example the difference in well-being between those in the 20% of the population with the lowest total household net income (first income quintile) and those in the 20 % of the population with the highest total household net income (fifth income quintile). Life satisfaction seems to be a pretty good measure of overall well-being, but it can neither be taken as the only nor the complete one.

3.1.2. Public welfare and income
To examine the relationship between the perception of well-being and the different segments of society according to the amount of income received, we first examine whether such a relationship exists at all. To allow for a more detailed analysis that looks at income deciles, we have grouped the data by geographic region. Figure 4 shows the average standardized welfare score for each income decile (total household net income) by region. Broadly speaking, a similar trend can be observed in some of the regions, with community well-being peaking around the second or third income decile, then remaining relatively unchanged or slightly declining as income increases. However, some clearly contradictory trends can be observed in different areas.

Figure following on the next page

Figure 4: Average Income by Regions
(Source: ESS, 6th wave)

It also can be observed that in the southeastern regions, well-being rises with income relatively smoothly, and in the northwestern regions, perceived well-being is highest somewhere around the fourth decile before falling sharply as income decreases. The relationship between income and well-being does not appear to be as consistent across regions as the relationship between income and life satisfaction.

3.2. Health
The subjective perception of the health status is related in a statistically significant way to the feeling of happiness. At the same time, it should be borne in mind that the relationship is bidirectional – people who feel happy and satisfied cope better with health problems and generally live better than people who feel less happy (Schimmel, 2009; Layard, 2005; Diener and Sheligman) 2004).

3.3. Work-life balance
Work-life balance, i.e. how people integrate paid work with the rest of their lives and balance the demands of different roles is an important component of well-being. The increasing employment of women, single parenthood, declining fertility and an aging population bring to the fore the issue of reconciling professional and family needs. Conflict between the demands of work and family life is associated with poorer outcomes in marital relationships and child development, as well as with job satisfaction, absenteeism, and stress. These differences in working conditions, in turn, help explain significant differences in perceptions of work-life balance and, consequently, well-being. Findings from previous ESS research point to some clear lessons for managers - predictable working hours (which are not too long); Employee autonomy and the ability to decide start/end times and work during a standard work week is likely to improve work-life balance.

4. THE DESIGN OF BETTER PUBLIC POLICIES TO RAISE THE WELL-BEING: A VARIETY OF METHODOLOGICAL APPROACHES MAY CONTRIBUTE
The ESS 9 study of well-being in Bulgaria reveals clearly the necessity of further improvement of proper policies of sustainable development. Based on the UN 2030 Agenda, adopted by world leaders in 2015, Bulgaria as EU member state shares fully the strategy of the EU to the new global framework for sustainable development and the achievement of the 17 Sustainable Development Goals (SDGs).

The issues of the appropriately designed and adequately implemented EU and national policies to eradicate poverty and achieve prosperity and sustainable development by 203 are also closely related to the properly accomplished evaluation of the well-being of the individual. Sustainable development aims to meet the needs of the present generation without jeopardizing the ability of future generations to meet their own needs. In the specific scope of the work undertaken by the ESS, the concept of sustainable development for the individual means well-being "without leaving anyone behind". In the context of sustainable development, well-being is based on a holistic approach, bringing together economic, social and environmental considerations that reinforce each other. In this sense, ESS provides good opportunities to analyze subjective assessments of the level of well-being in order to select and implement better practices and policies. Attention to objective and subjective assessments of well-being explains the strengthening of the acknowledgement of the role of self-assessment of the individual social and economic status of the population and further application of specific methods in the analysis of well-being and its constituent components. The opportunities of the ESS 9 to assess the well-being in Bulgaria compared with other countries are very important as regards the subjective evaluation of level of living, the inequalities and poverty at the regions of the country, the state of provision of inclusive and equitable quality education and promote lifelong learning opportunities, ensure accessibility and rational use of water and water resources and sanitation conditions, etc. Based on the thesis of well-being as the focus of sustainable development further work is to be undertaken for comparative study of well-being by taking into consideration other official institutions' methodological approaches in order to evaluate of the interdependence of the three dimensions of well-being: economic, social and environmental. With regard to this a number of other European and global studies are also relevant for a comparative analysis of the results of the and well-being surveys. On one hand, the indicators of the European Quality of Life Survey ESS (EQLS) may be made good use as they cover to a greater extent the environmental and social aspects of progress which are discussed in public debates at EU and national level in the European Union (Eurofound,2018.) On the other hand, specific attention may be paid to apply the OECD Framework for Measuring Well-Being and Progress, as based on recommendations made in 2009 by the Commission on Measuring Economic Performance and Social Progress, to which OECD work in member countries has contributed significantly (OECD, 2020). There are a number of new initiatives to create alternative leading indicators of progress, such as the OECD's Better Lives initiative, which includes measures of subjective well-being. Social progress is about improving the well-being of people and households. Assessing this progress requires looking not only at the functioning of the economic system, but also at the diverse experiences and living conditions of people.

5. CONCLUSION
The research on personal and societal well-being offers valuable opportunities to deepen the understanding of the concept of well-being. One important conclusion is that well-being is a multidimensional concept. While the finding that higher-income households have higher well-being sounds largely intuitive, the fact that the size of the gap between high- and low-income households varies greatly across regions of the country is significant. This is an important message to policymakers interested in reducing inequality and making efforts to increase overall welfare that they should provide additional support to lower-income households. Further studies are needed to better understand why some regions have higher levels of wealth inequality than others and whether any policy recommendations can emerge from such comparisons. Investigating the extent to which income inequalities correlate with wealth inequalities would be interesting, given that the Nordic countries, where income inequality tends to be quite low, are also found to be among the countries with lowest inequality in welfare.

At this stage, it is not possible to establish a statistically significant relationship between community welfare and income by region. This can be interpreted in the direction that the increase of incomes, or rather the reduction of income inequality by region, is not imperative in terms of improving all aspects of well-being. Further investigation of the relative weight of each measure of well-being will be an important prerequisite for better policy choices. Bulgaria's upcoming participation in the common methodology sociological observations of the European Social Survey will provide opportunities for a more detailed analysis regarding how different segments of the population rate the different dimensions of well-being.

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APPENDIX

RESULTS FROM ESS 9TH WAVE

	Number	% of responses	Cumulative % of responses
Very happy	137	13.39	13.39
Moderately happy	539	52.69	66.08
Not very happy	224	21.90	87.98
Not happy at all	102	9.97	97.95
Can't decide	17	1.66	99.61
No answer	4	0.39	100.00
Total	1,023	100.00	

Table 1: How Happy Do You Feel?

	Number	% of responses	Cumulative % of responses
Completely satisfied	299	29.23	29.23
Very satisfied	320	31.28	60.51
Moderately satisfied	270	26.39	86.90
Neither one	78	7.62	94.53
Moderately dissatisfied	15	1.47	95.99
Very unsatisfied	11	1.08	97.07
Totally unsatisfied	10	0.98	98.04
Can't decide	11	1.08	99.12
No answer	9	0.88	100.00
Total	1,023	100.00	

Table 2: Satisfaction (dissatisfaction) with family relationships

	How happy/unhappy do you feel?						
How satisfied are you with family relationships?	Very happy	Moderately happy	Not very happy	Unhappy	Can't decide	No answer	Total
Completely satisfied	105	139	38	13	4	0	299
Very satisfied	28	231	45	14	1	1	320
Moderately satisfied	2	151	87	24	5	1	270
Neither one	0	13	42	20	2	1	78
Moderately dissatisfied	0	3	5	7	0	0	15
Very unsatisfied	0	0	3	8	0	0	11
Totally unsatisfied	0	0	2	8	0	0	10
Can't decide	2	0	0	5	4	0	11
No answer	0	2	2	3	1	1	9
Total	137	539	224	102	17	4	1,023

Table 3: Happiness and family relationships

	Number	% of responses	Cumulative % of responses
K up to 190 lv.	30	5.29	5.29
S from 191 to 390 lv.	82	14.46	19.75
D from 391 up to 520 lv.	46	8.11	27.87
N from 521 up to 650 lv.	33	5.82	33.69
G from 651 up to 780 lv.	43	7.58	41.27
T from 781 up to 910 lv.	38	6.70	47.97
L from 911 up to 1050 lv.	21	3.70	51.68
Q from 1051 up to 1300 lv.	23	4.06	55.73
F from 1301 up to 2000 lv.	16	2.82	58.55
J 2001 lv. and more	15	2.65	61.20
Don't want to answer	124	21.87	83.07
Don't know	96	16.93	100.00
Total	567	100	

Table 4: Income Distribution

	How happy do you feel?						
Income	Very happy	Moderately happy	Not very happy	Unhappy	Can't decide	No answer	Total
K Up to 190 lv.	8	5	8	8	1	0	30
S from 191 up to 390 lv.	7	28	32	13	1	1	82
D from 391 up to 520 lv.	4	25	13	2	2	0	46
N from 521 up to 650 lv.	6	16	8	2	0	1	33
G from 651 up to 780 lv.	6	22	13	2	0	0	43
T from 781 up to 910 lv.	4	26	5	0	1	2	38
L from 911 up to 1050 lv.	6	14	1	0	0	0	21
Q from 1051 up to 1300 lv.	5	14	3	1	0	0	23
F from 1301 up to 2000 lv.	4	10	2	0	0	0	16
J 2001 lv. and more	8	5	2	0	0	0	15
Don't want to answer	26	66	17	9	6	0	124
Don't know	4	87	2	2	1	0	96
Total	88	318	106	39	12	4	567

Table 5: Relationship between income and feeling happiness

INTELLECTUAL PROPERTY RIGHTS AS A SOURCE OF COMPETITIVE ADVANTAGE

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ABSTRACT
Intellectual property rights are comprised of a system of legal instruments that regulate the manner of acquisition of intellectual property as well as protection from unauthorized usage. Countries pass laws on intellectual property for two main reasons: the first reason is to legally express the moral and economic rights of creators to their creations and to regulate public access to said creations. The second reason is the government's policy of inciting creativity, disseminating intellectual property, and encouraging fair trade in order to ensure economic and social development. A brand can be described as a product with additional dimension and characteristics that help differentiate it from similar products aimed at satisfying the same needs. These differences can be rational and material or symbolic, emotional, and immaterial. The competition on the brand market is fierce – one could also describe it as a 'brand war.' These are some of the crucial facts brand and trademark owners encounter every day. For these reasons, research of intellectual property has been conducted, and the company 'Kraš' has been used as an example. Kraš is Croatia's largest confectionery company. It currently holds the position of the region's leading producer and owns over 120 international trademarks registered with WIPO (The World Intellectual Property Organization). Furthermore, Kraš also owns over 10 national trademarks registered with SIPO (The State Intellectual Property Office). Given the wide variety of confectionery products, the decision to register a certain product depends on the marketing strategy, trademark management, and the market potential of the product.
Keywords: intellectual property, brand, Kraš

1. INTRODUCTION
The globalization and industrialization processes have tremendously helped companies expand their businesses – the number of consumers has increased, whereas companies gained more space to create new products and services. This resulted in creation of more companies, which contributed to a fiercer market competition. Therefore, in order to be competitive, innovative, and quickly adaptable to the market, a company must keep up with both the trends and the demands of the consumers. When it comes to the formation of the international market, competitiveness makes for an important factor. It is a real challenge to distinguish one company from the plethora of similar organizations.

Prosperity on the global market depends on a company's ability to create new value via innovation and protect said new value via intellectual property protection systems. "Intellectual property is becoming an important element of the international market, whereas the small size of the Slovenian market commands that the Slovenian industry focus on the global consumers. International rules on intellectual property are relevant to the Slovenian industry, which is characterized by the predominance of small and medium companies. Creativity, the driving force that develops modern technological solutions, is the fundamental leverage necessary to increase productivity and strengthen the material basis, as well as the competitiveness of our companies and entrepreneurs. These business entities have an important task of simultaneously developing their own technology and identity based on the achievements of modern science and incorporating the knowledges and creation designs obtained via licencing into their own production." This statement by Rozman can apply to both Slovenian and Croatian markets. Kraš is one of the leading companies in the food industry on the Croatian market; moreover, it is also present on foreign markets. Kraš is a company that produces sweets – cocoa products, cookies, waffles, candy, chocolate, etc. These products are frequently bought and enjoyed all over the world, hence the fierce market competition. There are numerous companies that manufacture sweets and similar products; consequently, it is very difficult to acquire a significant market share in this industry. For that reason, this paper provides an analysis of the influence of the brand on the global market entry; specifically, how the brand 'Kraš' affects consumers compared to other competing companies. The hypotheses that were supposed to be confirmed via research are as follows:

- H1: Any company that protects their products via trademark is more competitive due to improved recognizability and increased sales.
- H2: The trademark registration process is taxing, but also profitable in the long run, as it ensures a market share for the company.

2. INTELLECTUAL PROPERTY

From a business point of view, intellectual property makes for intangible assets. If successfully utilized, it can provide a valuable foundation for or contribution to business (On Intellectual Property, 2020). An appropriate system for legal protection of intellectual property has been developed not only to protect this kind of goods, but also encourage human creativity (which contributes to the overall social development). Intellectual property rights are comprised of a system of legal instruments that regulate the acquisition of intellectual property and protection from unauthorized usage. In a broader sense, intellectual property implies legal rights that arise from intellectual activity in the industrial, scientific, literary of artistic domain. Countries have put in place laws on intellectual property for two reasons. The first reason is the need to legally express moral and economic rights of creators to their creations as well as regulate public access rights to said creations. The second reason lies within the governments' policies of inciting creativity, disseminating creative work, and encouraging fair trade in order to ensure economic and social development. Basically, the objective of the law on intellectual property is to protect creators and other manufacturers of intellectual property by assigning time-limited rights to control the usage of such creations. These rights do not apply to the physical objects that can embody the creation, but to intellectual creation in itself. Intellectual property can traditionally be split into two branches: industrial property and copyright. According to the WIPO Convention (the constituent instrument of the World Intellectual Property Organization, signed in Stockholm on July 14, 1967; section 2, VIII), intellectual property includes rights pertaining to literary, artistic, and scientific work, scientific discoveries, industrial models, brands, trademarks, protection from disloyal competition, and all other rights that arise from intellectual activity in the industrial, scientific, literary, and artistic domain (WIPO, 2004).

Unauthorized usage or reproduction of intellectual property constitutes a violation of rights. The owner of intellectual property rights is protected via means and institutions of the legal system. Intellectual property encompasses two sub-groups of rights – copyright and neighbouring rights and industrial property rights. Copyright implies the exclusive right of the author to make their literary, scientific, or artistic work, as well as work from other creative domains, available. The same applies to neighbouring rights of performers, phonogram producers, and publishers. Industrial property includes rights to protection of all business interests of the producer, their market position, and resources invested into research, development, and promotion. Some aspects or characteristics of the product can be protected via one or several mutually complementary forms of intellectual property. For example, a patent protects a new technical solution, an industrial design protects a new look or appearance of the product, whereas a trademark protects the sign or symbol that differs from similar signs used by other products or services on the market (On Intellectual Property, 2020). An efficient and just intellectual property system can help countries realize the potential of intellectual property as a catalyst of economic development and societal and cultural prosperity. The intellectual property system helps establish a balance between the interests of innovators and the public, as it creates an environment in which creativity and innovation can generate progress for all (WIPO, 2004).

3. BRANDS AND THE PROCESS OF TRADEMARK REGISTRATION
Every time a logo or symbol is made for a new product, a new brand is created. However, many theorists and managers usually define a brand as creation of a certain capability, reputation, and significance on the market. The making of a successful brand includes a combination of different elements arranged in a unique way: the product or service must be of high quality and must satisfy the consumers' needs, the brand must be appealing and in accordance with the way consumers experience the product; moreover, the packaging, promotion, price, and other elements must add to the suitability, appeal, and differentiation of the product. When buying a product, it is very important that we have previous experience with the brand we are purchasing - therefore, brands make it easier to decide which products to buy. Likewise, branded products carry additional value, unlike non-branded products (Peić, 2016:4). A brand does not represent exclusive ownership in the eyes of the consumers – buyers tend to view a brand as a set of benefits they will receive from certain products or services. A brand represents general experiences a consumer has had with the product, the shop, its employees, and all other elements that contribute to the differentiation of a certain product on the market. The impression a brand makes on the consumer depends on numerous factors that must be wisely and strategically employed by the manufacturer in order to outwit the competitors and achieve the status of a brand that incites consumer loyalty (Žižak, 2016:9).

3.1. Trademark registration
Name, logo, symbol, label, or other characteristic features of products and/or services can be protected via a trademark. A registered trademark is a form of legal protection of the market identity of a product or a service. The trademark registration process begins when the trademark registration form is filed with the State Intellectual Property Office (WIPO convention, 1979). A trademark is an efficient instrument that provides manufacturers and suppliers with the protection of funds they have invested into promotion and marketing of their goods and services. Creation of a sign, logo or a label can be protected by copyright in itself and thus counts as intellectual property of its creator. In Croatia and in many other countries, trademark protection is valid for 10 years from the day of filing the registration paperwork. The protection period can be extended an unlimited number of times. Each extension is valid for another 10 years and can be obtained by filing the request in a timely manner (usually before the previous

protection period is up) and paying certain fees and charges (On Intellectual Property, 2020). If the company chooses to forego trademark registration, they must understand that other businesses can now use said trademark and register it as their own property, thus utilizing it completely and banning others from using it on their products and services. The following symbols are used to express trademark protection (Vranešević, 2007:31):

- TM (trademark),
- ®,
- SM (service mark).

A company must file a separate application for every symbol they wish to protect, whereby the application must contain a list of goods and/or services pertaining to the trademark. The aforementioned list must be in accordance with the International Classification of Goods and Services for Trademark Registration Purposes (the so-called Nice Classification). Once filed, the list of goods and services can no longer be expanded. The aforementioned list must be compiled with great care, as it determines the scope of trademark protection. When filing the trademark application, it is recommended to use the terms from the Croatian version of the TMclass database, a synchronized database of products and services powered by the European Union Intellectual Property Bureau (EUIPO), or the EUIPO webpage in order to create an organized, alphabetical list of all products and services from a certain class. Trademark registration application must be filed with the State Intellectual Property Office via a Ž-1 form, along with proof of payment of the administrative fee and the examination cost (Intellectual Property, 2020). Terms, conditions, and the process of trademark registration in Republic of Croatia have been prescribed by the Trademarks Act (NN 14/19) and the Trademarks Regulation (NN 38/19). It is always good to search through the Croatian trademark database prior to filing an application (in order to determine whether any identical or similar trademarks already exist). This helps avoid unnecessary costs or disputes. Registered industrial property attorneys can provide professional help prior to start of the registration process as well as representation in any administrative or court proceedings. In Republic of Croatia, trademark registration application can be filed in person or online, via e-application services of the State Intellectual Property Office. This option provides lower costs and an efficient application process (Intellectual Property, 2020). The registration application must be filed with the State Intellectual Property Office and must contain the following: a trademark registration request, applicant's personal data, a list of products and services that are encompassed by the trademark, and the design of the trademark. Goods and services listed in the application must be classified in accordance with the Nice Classification System. The applicant must clearly and precisely define the products and services that are encompassed by the application, so the authorized bodies and business subjects can determine the scope of the requested protection based solely on the filed paperwork (Trademarks Act, NN 14/19, section 35, paragraph 2). If the application does not meet the requirements, the State Intellectual Property Office will ask the applicant to remedy the shortcomings within the following 30 days. If the Office finds absolute reasons to refuse trademark registration, they will notify the applicant in writing. The Office will provide a written explanation, and furthermore invite the applicant to respond with a statement and include all facts that might influence the final decision within the following 60 days. The applicant must remedy all shortcomings within 30 days of receiving the Order (Trademarks Act, NN, section 42, paragraph 1).

4. RESEARCH

A primary study has been conducted in order to confirm the hypothesis about the final contribution of the trademark to the company. The primary research has been conducted from June to September of 2020 in Croatia and Slovenia. The sample was comprised of 200

respondents of various ages and professions. The respondents were anonymous. The surveys were filled out via social media, e-mail or in person. The questions were aimed at finding out the following information: (1) how were Kraš products received on the Croatian and Slovenian market, (2) how are Kraš's sales affected by the competitors' products, (3) which Kraš products are sold most and (4) how do Kraš products compare to non-branded products?

Gender	Number of respondents % CRO	Number of respondents % SLO
M	35	53
F	65	47

Table 1: The structure of respondents by gender
(Source: Author's work)

200 persons from Croatia and Slovenia have completed the survey (100 persons from Croatia and 100 persons from Slovenia). 56% of the respondents were female, whereas the remaining 44% were male.

Age	Number of Respondents % CRO	Number of Respondents % SLO
20 years old or under	10	9
20 to 30 years old	22	13
30 to 40 years old	36	44
40 to 50 years old	21	27
50 years old or over	11	7

Table 2: The structure of respondents by gender
(Source: Author's work)

According to the survey, 19 of the respondents (9,5%) were 20 years old or younger; 35 persons (17,5%) were between 20 and 30 years old, whereas 40% of the respondents were between the ages of 30 and 40. A little under 25% were in the age bracket 40-50, whereas only 9% of the respondents were 50 years old or older.

Education Level	Number of Respondents % CRO	Number of Respondents % SLO
Elementary School	3	5
High School	26	22
Bachelor	35	33
Master's	30	31
PhD	6	8

Table 3: The structure of respondents by education level
(Source: Author's work)

8 respondents have only completed elementary school. Just over a quarter of respondents attended high school (and completed 2, 3 of 4 years). The majority of the respondents, i.e., 34%, held a bachelor's degree, whereas 61 persons held a master's degree. 14 respondents have completed doctoral studies.

4.1. Research results

The following portion of this paper provides the results pertaining to the following questions: (1) how were Kraš products received on the Croatian and Slovenian market, (2) how are Kraš's sales affected by the competitors' products, (3) which Kraš products are sold most, (4) how do Kraš products compare to non-branded products?
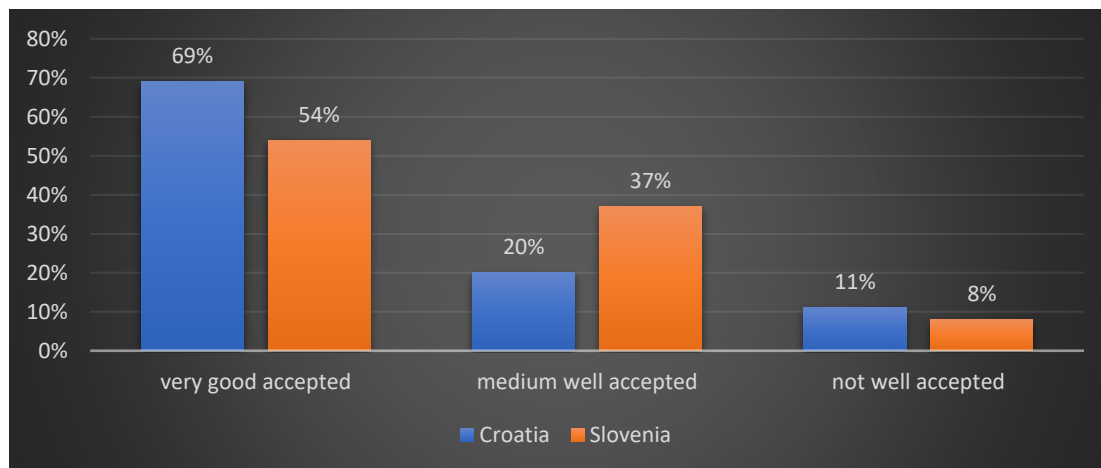
Chart 1: How were Kraš products received on the Croatian and Slovenian market
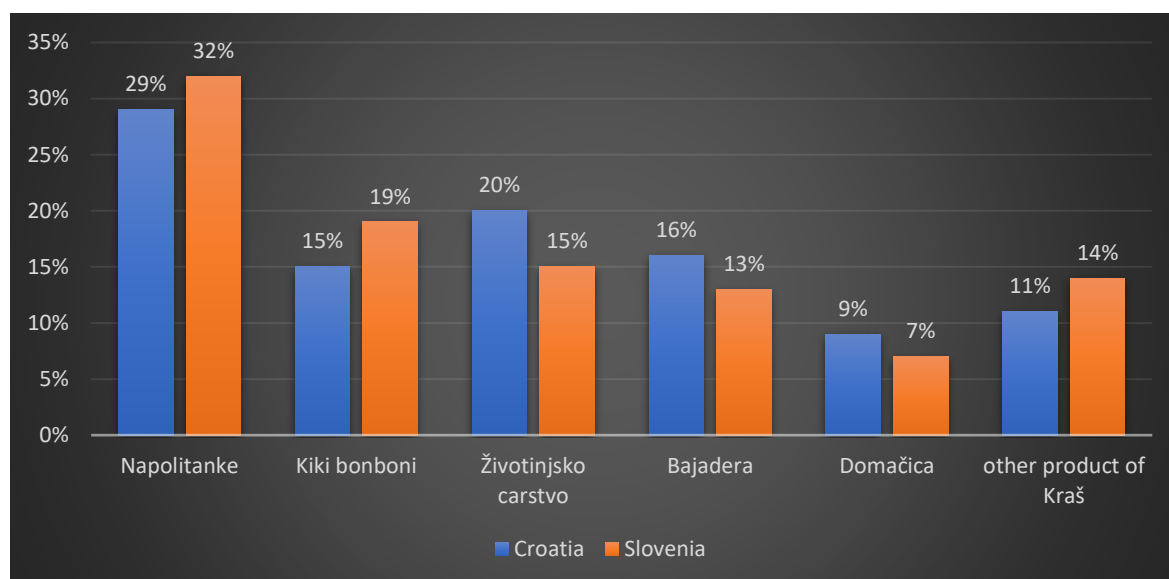*(Source: Author's work)*

Chart 1 shows the answers to the question 'How were Kraš products received on the Croatian and Slovenian market?' The majority of the respondents (69% from Croatia and 54% from Slovenia) responded with 'very well received,' whereas 20% of respondents from Croatia and 37% of respondents from Slovenia responded with 'moderately well received.' Only 8 persons from Slovenia and 11 persons from Croatia said Kraš products were not received well on the Croatian and Slovenian market.
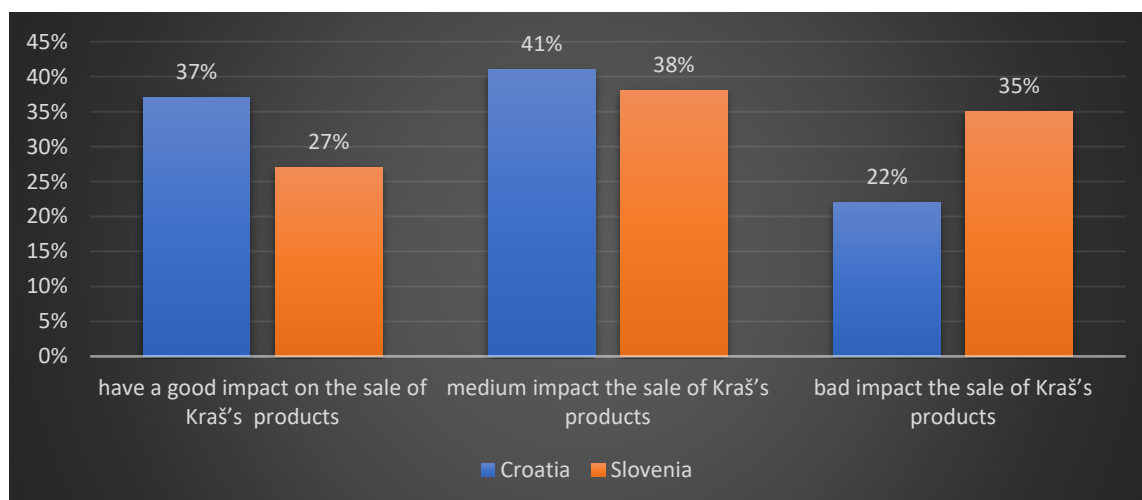
Chart 2: Influence of competing products on Kraš's sales
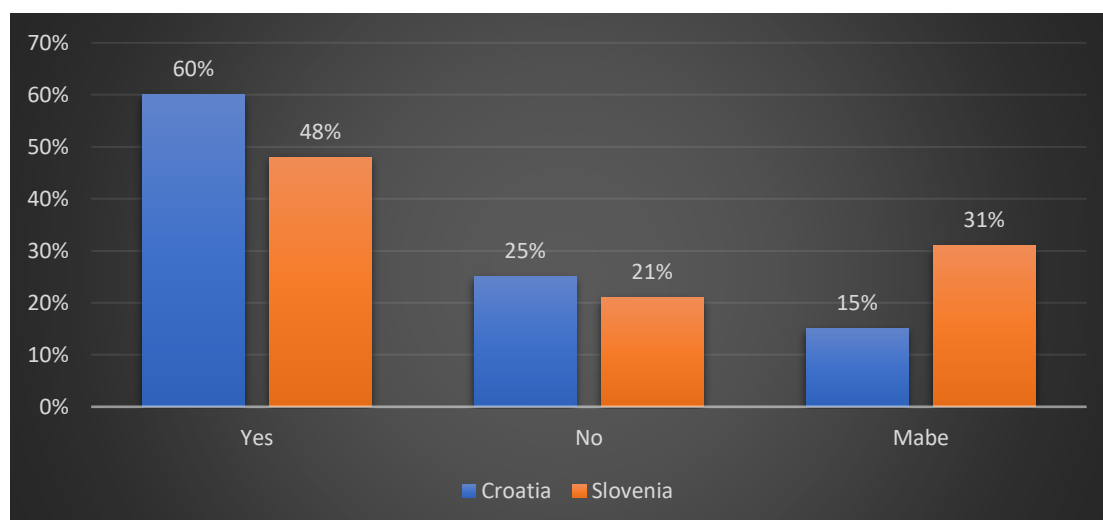*(Source: Author's work)*

Chart 2 shows the answers to the question: 'How are competing products affecting Kraš's sales?' The majority of respondents (41% from Croatia and 38% from Slovenia) responded with 'competing products have a moderate influence on sales' (depending on the type of the competing product).

Furthermore, 22% of respondents from Croatia and 35% of respondents from Slovenia responded with 'competing products don't have a positive influence on Kraš's sales,' whereas 37% of respondents believed that competing products have a good influence on Kraš's sales. This question was similarly answered by respondents from both Croatia and Slovenia.


Chart 3: The best-known product by Kraš
(Source: Author's work)

Chart 3 demonstrates that this question was answered very similarly by respondents from both Slovenia and Croatia. The fact that the wafers are the most popular product by Kraš comes as no surprise – both in Croatia and in Slovenia. 30,5% of respondents said wafers were Kraš's best-known product. It is interesting to note that wafers are more popular in Slovenia than in Croatia. 32% of Slovenian respondents and 29% of Croatian respondents chose wafers as the best-known product. Kiki candy, Animal Kingdom and Bajadera enjoy equal popularity in both Croatia and Slovenia. 12,5% of respondents chose a product that was not listed in the survey as their favourite. Bajadera was chosen as the best-known product by only 16 respondents (8%), which makes it the least popular Kraš product.


Chart 4: Is a company that owns a trademark more competitive?
(Source: Author's work)

Chart 4 shows the answer to the question 'Is a company that owns a trademark more competitive (with regards to increased recognizability and sales)?' The majority of respondents (54%) responded with 'yes,' whereas 46 respondents responded with 'maybe.' 23% of respondents said 'no, companies that own trademarks are not more competitive.'
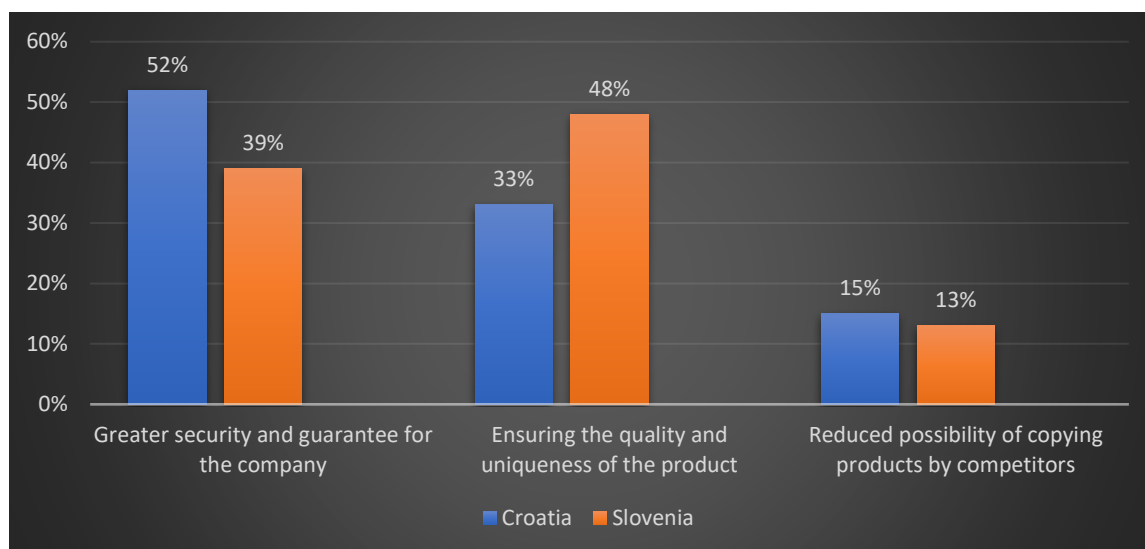
Chart 5: The biggest advantage of the 'Kraš' brand
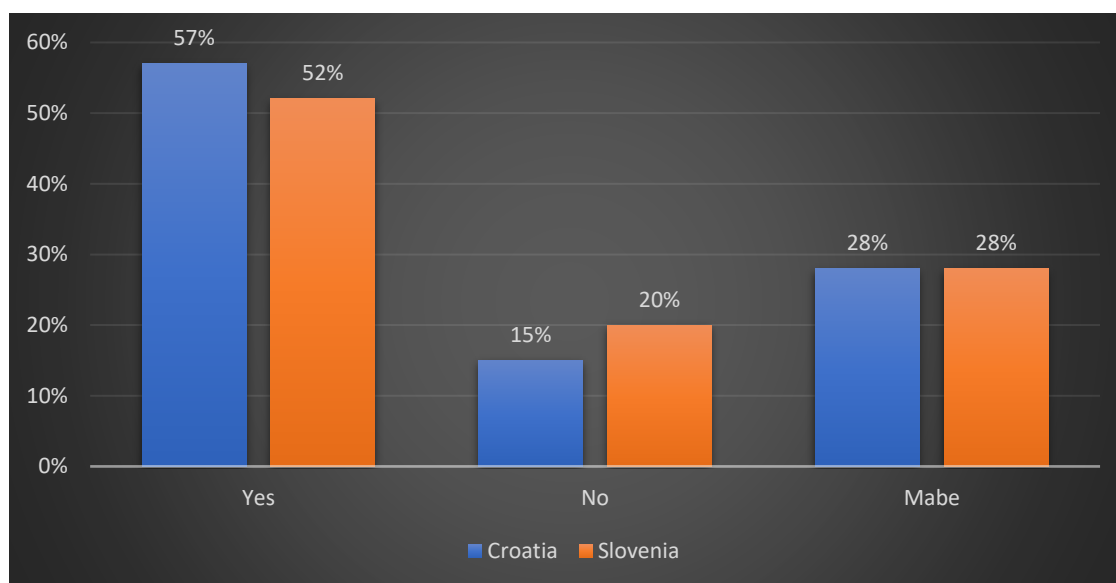*(Source: Author's work)*

Chart 5 shows the answers to the question about the biggest advantage of the 'Kraš' brand. The majority of respondents (45,5%) responded with 'improved safety and company guarantee,' whereas 14% responded with 'a lowered possibility of products being copied by the competitors.' 81 persons responded with 'quality guarantee and product uniqueness.'
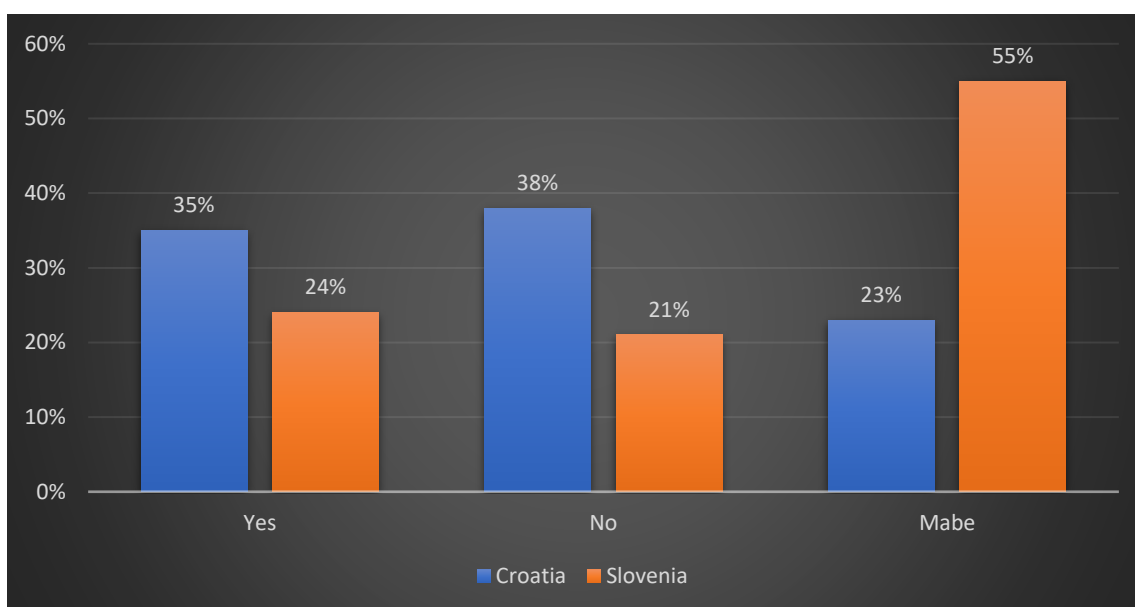
Chart 6: Frequency of copying the name, packaging and shape of products branded by Kraš
(Source: Author's work)

Chart 6 shows the answer to the question: 'Do competitors copy Kraš's name, packaging design and product shape often?' The majority of respondents (39%) responded with 'maybe.'

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The respondents were not certain, but believed some companies might copy the Kraš brand, i.e., the respondents did not pay much attention to competitors and their attempts at copying the Kraš brand.

Chart 7: Long-term profitability of the 'Kraš' branded products
(Source: Author's work)

Chart 7 shows the answers to the question 'is the 'Kraš' brand profitable in the long run?' The majority of respondents (54,5%) responded with 'yes,' whereas 35 persons responded with 'no.' 56 respondents settled on 'maybe.'

5. CONCLUSION

According to Hypothesis 1, 'Any company that protects their products via trademark is more competitive due to improved recognizability and increased sales.' Research results have shown that the majority of respondents (54%) responded with a yes – a company that protects their products is more competitive due to improved recognizability and increased sales. 24% of respondents responded with a maybe, whereas another 24% of respondents answered with a no – a company that owns trademarks is not more competitive. According to Hypothesis 2, 'The trademark registration process is taxing, but also profitable in the long run, as it ensures a market share for the company.' This hypothesis has also been confirmed, as over 50% of respondents answered this question with a yes. Only 17,5% of respondents had a different opinion. A registered trademark is a form of legal protection of the market identity of products and services. The trademark registration process begins once a trademark application has been filed with the National Intellectual Property Office. A trademark is an exclusive industrial property right that encompasses a distinguishing mark (or a combination of marks) and holds a certain value in the eyes of the clients. Trademark protection is efficient as it protects the assets of the manufacturers and suppliers who invested funds into promotion and marketing of their goods and services. Creation of a sign, logo or a label can be protected by copyright in itself and thus counts as intellectual property of its creator. In Croatia and in many other countries (including Slovenia), trademark protection is valid for 10 years from the day of filing the registration paperwork. The protection period can be extended an unlimited number of times. Each extension is valid for another 10 years and can be obtained by filing the request in a timely manner (usually before the previous protection period is up) and paying certain fees and charges. Trademark registration reduces the risk of forgery.

If the company chooses to forego trademark registration, they must understand that other businesses can now use said trademark and register it as their own property, thus utilizing it completely and banning others from using it on their products and services. A brand has a higher market value if consumer loyalty, perceived quality and strong associations with the brand exist. Brand loyalty is measured by the probability that the consumers will still use certain brands, regardless of changes in market conditions and efforts of the competitors who sell similar products, in the following time period. This further confirms Hypothesis 1 - any company that protects their products via trademark is more competitive due to improved recognizability and increased sales. Companies who own strong trademarks and brands also generate large market shares and higher repurchase rates. A brand must receive solid financial and marketing support (brand advertising) in order to survive in the long run. This fact is in accordance with Hypothesis 2 - the trademark registration process is taxing, but also profitable in the long run, as it ensures a market share for the company. Consumer loyalty to the brand and the trademark is very important to the company. A loyal customer won't be sensitive to prices, as they know that the product in question satisfies their needs. Hence, a cheaper alternative won't influence their decision to purchase the product. Brand and trademark loyalty is also proven via repurchase, which generates larger profits for the company. Every company that wishes to achieve competitive advantage on the market and build a successful brand must invest copious funds into development of consumer loyalty. Consumers are the ones that influence the company's profitability, market share, reputation, and success. Improved consumer loyalty automatically means improved business success.

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ECONOMIC AND SOCIAL EFFECTS OF COVID-19 PANDEMIC ON THE TAX REVENUES IN BULGARIA

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ABSTRACT
The unprecedented socio-economic reality faced by civil society, business and government bodies as a result of the COVID-19 pandemic reflected on the slowdown of economic activity worldwide, including in Bulgaria. The complicated conjuncture necessitated the adoption of a countercyclical strategy to overcome the economic consequences of the pandemic. The fact that the current situation has no analogue in the new world history in terms of scale also determines the relevance of the researched issues. Its aim is to examine the financial and fiscal measures taken by the Bulgarian government to support households, businesses and government bodies to overcome the crisis and the resulting socio-economic effects on tax revenues. An assessment of the impact of the COVID-19 pandemic on tax revenues in Bulgaria was also carried out, the trend in their collection in the future was predicted and recommendations were indicated regarding strengthening the recovery process in the context of the new realities.
Keywords: *COVID-19, tax revenues, anti-crisis measures, linear regression model*

1. INTRODUCTION

World history offers numerous and various by nature examples of economic malfunctions, which, in today's open economy conditions transfer their negative effects to the regional and even the global level. Although of a local origin, such economic shocks have the potential to escalate into a global recession with long-term consequences. The COVID-19 pandemic is a typical such example, as the negative effects on the Bulgarian economy led to a serious deterioration of public finances. Bulgaria's good fiscal position at the beginning of the pandemic allowed the introduction of a fiscal support package during the emergency situation. This externally imposed rethinking of tax and spending policy in the course of the 2020 budget year highlighted the importance of taxes and tax revenues as a tool for conducting a discretionary fiscal policy. The fact that this is a situation of no precedent in the modern world, including for Bulgaria, determines the relevance of the topic. The most accurate possible assessment of the consequences on tax revenues in Bulgaria, which are the main source of funds to fight the crisis and to finance measures to mitigate the effects from it, can be the basis for further research on the efficiency of the anti-crisis policy. In this regard, the paper aims to examine the financial and fiscal measures taken by the Bulgarian government to support households, businesses and government bodies in overcoming the crisis and the resulant socio-economic effects on tax revenues. The monetary policy conducted in Bulgaria in the conditions of the Covid-19 pandemic remains outside the research focus. Based on the findings from the conducted analysis, an assessment of the impact of the COVID-19 pandemic on tax revenues in Bulgaria is made and the trend in their future receipts is predicted.

2. COVID-19 IMPACT ON THE BG ECONOMY AND ADMINISTRATION MEASURES IN RESPONSE TO THE CRISIS

2.1. Covid-19 impact on the bg economy

According to data from the European Statistical Recovery Dashboard, the COVID-19 pandemic affected all levels of socio-economic life: individual, households, business and state. The world economy, and in particular the Bulgarian economy, reported its biggest decline not only in the 21st century, but in modern history in general, which is why a number of researchers of the problem (Zahariev, et al., 2020), (Ganchev, 2022) compare the economic consequences only with those of the Great Depression of 1929-1933. In Bulgaria, the first case of the virus was reported in early March 2020, and as a result the central and local authorities took immediate measures to control the spread of the infection. The restrictive measures taken in Bulgaria had a negative effect on public, household and corporate finances, leading to a 7.3% Q-o-Q decline in GDP in Q2 2020, against an EU average of 11.2% for the same period; an increase in the unemployment rate to 6.7% M-o-M in April 2020, against a maximum European average of 7.8% in August 2020; an increase in the budget deficit to 15.5% to GDP in Q4 2020, against an EU average of 6.4% for the same period, and in public debt to 25% to GDP in Q3 2020, against an EU average of 89.4% for the same period. As a result of the lockdown, the Labour market slack indicator increased its value in Bulgaria to 10.6% in Q2 of 2020, with an average European value of 15%; the industrial production index fell by 11.9% M-o-M in April 2020, with an average drop for the EU of 19%, and the services turnover – by 10.2% for the same period (-16.3 for the EU). The services sector, an important part of private consumption in Bulgaria, was strongly affected, as indicative in this regard is the value of the indicator 'Nights spent in tourist accommodation', which fell by 94.9% Y-o-Y change in April 2020, the import of goods and services went down by 19.7% on a monthly basis in April 2020, and declared bankruptcies up by 26.1% Q-o-Q change in Q3 2020 (EU average 16.9% for the same period). The cited data argue for the thesis that the COVID-19 pandemic has negatively affected economic activity in Bulgaria, interrupting the "impressive economic progress" following the country's accession to the EU. The January 2021 OECD Economic Review for Bulgaria states that the COVID-19 pandemic interrupted this positive development, a similar decline in GDP in Bulgaria has not been seen since the banking crisis of 1996-1997. (OECD, 2021).

2.2. Administration measures in response to the crisis in Bulgaria

Compared to the banking crisis in 1996-1997 and the financial and economic crisis in 2009, the situation created by the COVID-19 pandemic is diametrically opposed. While in the first case the problems started in the financial sector and spread to the real sector (Zahariev, Angelov, & Zarkova, 2022), according to (Petranov, Zlatinov, Velushev, & Karaivanov, 2020) in the COVID-19 pandemic, the direction is the opposite: the effect of the reduction of the aggregate supply with the suspension of the activity of whole industries due to the crisis health, economic and social situation in Bulgaria called for a rethinking of the tax and expenditure policy, while the current good fiscal position allowed the introduction of a fiscal support package during the emergency situation. Fiscal measures at the national level, together with financial support from the EU through the various instruments and programmes were, in the period 2020-2021, the main anti-crisis measures in the anti-cyclical strategy to overcome the economic consequences of COVID-19, which on its own determined the other difference between this and the previous economic crises. Although scientific knowledge and experience, based on the classical theory of non-intervention of the state in the economy, considers the instruments of monetary policy as basic and the fiscal policy ones as auxiliary, in this case the situation was reversed, the overall effect being positive. This view is supported by the research of (Tsvetkov & Georgieva, 2021), according to which the interaction between the fiscal and monetary measures taken in Bulgaria is of decisive importance in the anti-crisis macroeconomic policy, but the main instrument is

the fiscal policy, and the complementary instrument - monetary measures. For this reason, the focus of the study is on the financial and fiscal measures taken by the Bulgarian government to support households, businesses and government bodies to overcome the crisis and the resultant socio-economic effects on tax revenues. The monetary policy conducted in Bulgaria in the conditions of the Covid-19 pandemic remains outside the research focus. The first group of measures targeted the household sector and were of socio-economic nature. The purpose of their implementation was to provide for direct liquidity support for citizens and families whose incomes have been severely affected by the pandemic and who belong to the most vulnerable groups (Decree № 151 of July 3, 2020 determining the terms and conditions for payment of funds for maintaining the employment of workers and employees after the state of emergency declared by the decision of the National Assembly of March 13, 2020 and the extraord., 2020). The payment of supplements to the pensions of all pensioners started from the very onset of the crisis (April 2020) and still continues, providing for additional funds to meet emergency expenses. In addition, the pensioners with extremely low incomes, were entitled to a one-time financial support of BGN 120 for food products. The minimum pension was also increased to BGN 300, as from January 1, 2021 (Act on Measures and Actions during the State of Emergency, 2020). Apart from pensioners, liquidity support was also provided for the employed. This group of measures includes compensations in cash for unemployment, for temporary incapacity for work due to infection with COVID-19 and quarantine, as well as the provision of free vaccines and medicines in the fight against the pandemic. In relation to the transition to online education, financial support was provided for parents of children below the age of 14, who cannot work remotely and are not entitled to paid leave. Another support to ease the budgets of families with children was provided under the Law on Family Allowances for Children, and with an amendment to the Law on Personal Income Taxes, the threshold of tax relief for children was revised for 2020 and 2021, incl. for children with disabilities. The second group of measures aimed at financial support and incentive to the general government bodies in charge with activities to curb the pandemic and mitigate the consequences of COVID-19 (mainly doctors, medical workers and non-medical personnel working on the so-called "front line"). For example, such are the expenses related to: the hazard pay for medical and dental staff working in the conditions of an epidemic situation and COVID-19 treatment; provision of protective equipment (facemasks, gloves, protective clothing, Covid-19 tests, disinfectants, thermometers, etc.) for the needs of medical facilities, state administration and schools; subsidies, capital transfers and expenditure on medical facilities (MC, 2021). The third group of measures are the most comprehensive in terms of financial size and scope and can be characterised as stimulating businesses and households to overcome the negative consequences on the most affected groups of the population and sectors of the economy. Because of the emergency measures implemented to curb the spread of COVID-19 in Bulgaria, a number of companies had to close, the activity of other was strongly restricted. In this regard, the Act on Measures and Actions during the State of Emergency as well as a special decree of the Council of Ministers provided for a package of measures, aimed at guaranteeing the payment of wages to workers and employees of enterprises affected by the state of emergency. For the two years marked by Covid-19 (2020 – 2021), the financial resources spent on this group of measures from the national budget and EU funds amounted to more than 2 billion euros, distributed in six directions (seeTable 1):

- Micro-, small and medium enterprises
- Large enterprises
- Municipalities, public-private partnerships and enterprises
- Self-isured and self-employed individuals
- Agricultural and livestock producers
- Tourism

The measures for micro-, small and medium-sized enterprises consisted of grants, preferential loans and investment incentives aimed at maintaining employment in the affected sectors by providing grants for working capital of small enterprises; direct grants to persons carrying out tour operator, travel agent activities, bus transport; operating capital for the purchase of raw materials, and consumables, costs for external services and salaries for personnel of Bulgarian medium-sized enterprises. The mentioned measures aim to stabilize the current financial position of the affected enterprises, as well as to help them keep their employees. The 60/40 scheme financed by the National Social Security Fund is defined as the most large-scale short-term instrument for urgent business support to preserve employment and to guarantee the income of workers and employees. The scheme envisages paying 60 per cent of the employee's insurable earnings and of the social contributions due for each worker or employee, in the case of a decline in sales revenue declared by the employer of no less than 40 per cent. This resulted in retaining the jobs of workers and employees whose activities were discontinued or have worked part-time during the state of emergency, have taken leave on the basis of Art. 173a of the Labour Code, have been notified for mass dismissals or were employed in the "Accommodation and Food Service Activities" and "Other Passenger Land Transport n.e.c."sectors. Apart from the measure discussed above, another one has also been applied to maintain the employment in the "Transport" and "Tourism" sectors, as the most affected by the pandemic. The measure was financed under a project of the OPHRD and envisages support for employers and self-insured persons whose economic activity has directly been affected by the negative impact of the state of emergency imposed in the country, the beneficiaries given the right to apply both for it and the 60/40 measure in a total amount up to 80 per cent of their monthly income. Other sub-measures for direct grants and preferential loans to affected persons are financed through the OPHRD and the financial mechanism REACT-EU. The projects "Employment for You" and "Keep me On" allow full-time or part-time employment of unemployed persons mainly in the "Accommodation and Food Service Activities" and "Other Passenger Land Transport n.e.c."sectors. REACT-EU plus OPIC ensure the implementation of measures for offering loans on preferential terms to Bulgarian small and medium-sized enterprises by commercial banks. The financing of the growth potential or the current costs for the development of the main product or activity of startups and fast-growing companies are part of the measures of an investment nature implemented through the Funds for Equity and Quasi-Equity Investments financed by the Fund of Funds, private investors and the Venture Capital Fund. The enterprises which the Accounting Act categorises as large, can also apply for state aid, but unlike the micro-, small and medium-sized enterprises, the measures intended for them are only for grant support (i.e. no preferential lending and investment measures are envisaged). Here applicable are the measures "60/40", "Maintaining the employment in the sectors "Transport" and "Tourism", "Employment for You" and "Keep me On", the requirements to apply being similar to those discussed above. Other organizations entitled to apply for coronavirus relief funding through the Fund of Funds, are municipalities, public-private partnerships and enterprises. For self-insured and self-employed persons, the crisis package of measures provides for individual financing. It is implemented through microloans for self-employed persons and small start-ups or zero-interest loans for individuals on unpaid leave and self-insured. Financial resources are granted by applying to a partner commercial bank, in the first case the resources being provided by the Fund of Funds, and in the second, by the BDB. Support for agricultural and livestock producers is provided through RDR and State Fund "Agriculture". The financial and fiscal measures described above are of an expenditure nature, because they were implemented with decisions of the Council of Ministers of the Republic of Bulgaria by means of transfers from the government budget, other constituent budgets of the CFP or EU funds. Last but not least, are to be mentioned the revenue measures implemented in the last 2 years.

The changes in the tax legislation concerned a number of laws, the current amendments and additions to the Value Added Tax Law, Personal Income Taxes Act and the Corporate Income Tax were of anti-crisis nature. The reduction of the VAT rate for the supply of certain goods and services to 9% for the period 01.07.2020 - 31.12.2021 and the exemption of certain medical goods necessary to fight the pandemic imported by state organisations from VAT and customs duties, eased the legal entities and the state organizations in a situation of dificulties in the management of the short-term liquidity. The deadline for submitting annual tax returns and the payment of the annual tax by individuals and legal entities was also extended. On the one hand, this put an additional burden on the central budget, because it disrupted the regularity of tax revenues, but at the same time provided for a breath of fresh air for companies and households at the outbreak of the crisis.

Table following on the next page

Organisational form	Type of mesure/sub-measure		Financial resource (BGN)	Funding authority
1. Micro-, small and medium enterprises	**1.1. Direct grants**	1.1.1Support for small enterprises of turnover over BGN 500 000	78 233 200	OP "Innovation and competitiveness" + National funding
		1.1.2. State aid scheme for tour operators and travel agents	51000000	State aid, direct grants
		1.1.3. Support for bus and coach SMEs	30000000	State aid, MTITC
		1.1.4. Support for micro- and small enterprises for overcoming the economic effect of the COVID-19 pandemic (Measure 3-10)	173000000	OPIC
		1.1.Support for the medium-sized enterprises for overcoming the economic effect of the COVID-19 pandemic	200000000	OPIC
		1.1.6.Measure „60/40"	2000000000	National Social Security Fund
		1.1.7. Measure for maintaining the employment in the sectors "Transport" and "Tourism"	80000000	OPHRD
		1.1.8. Employment for You	50000000	OPHRD
		1.1.9 Keep me On	100000000	OPHRD+ REACT-EU
	1.2. Preferential lending measures	1.2.1. Portfolio guarantee programme of BDP to support liquidity of businesses	158000000	State aid guaranteed by BDB
		1.2.2. Recovery Programme (Fund of Funds)	96000000	OPIC + REACT-EU
		1.2.3. Microloans for self-employed persons and small start-ups (Fund of Funds)	24000000	OPIC + REACT-EU
		1.2.4. Portfolio guarantees to support the liquidity of SMEs (European Investment Fund/JEREMIE)	160000000	EIF
	1.3. Measures of investment nature	Equity and quasi-equity funds	225000000	Fund of Funds + private investors + Venture Capital Fund
2. Large enterprises	**2.1. Direct grant measures**	2.1.1.Measure „60/40"		Narional Social Security Fund
		2.1.2 Measure for maintaining the employment in the sectors "Transport" and "Tourism"	80000000	OPHRD
		2.1.3. Employment for You	50000000	OPHRD
		2.1.4 Keep me On	100000000	OPHRD+ REACT-EU
3. Municipalities, public-private partnerships and enterprises	Financing of urban development projects		353000000	Fund of Funds
4. Self-insured and self-employed individuals	4.1. Microloans for self-employed individuals and small startups		24000000	Fund of Funds
	4.2. Zero-interest loans for individuals on unpaid leave and self-insured people			Bulgarian Development Bank
5. 3Agricultural and livestock producers	5.1. Extraordinary temporary support to farmers and SMEs particularly affected by the COVID-19 crisis	Sub-measure 21.1	101024692	RDP 2014 - 2020
		Sub-measure 21.2	5500000	RDP 2014 - 2020
		Sub-measure 21.3	8220086	RDP 2014 - 2020
	5.2. Liquidity aid to farmers		72000000	State Fund Agriculture
6. Tourism	Support to enterprises		30000000	MT
	Subsidy for charter flight operators			MT

Table 1: National financial measures to support the affected by the pandemic.
(Source: Author's interpretation of official documents)

3. CONDITION OF THE TAX REVENUES IN BULGARIA
3.1. Research method and Database

Undoubtedly, the COVID-19 crisis has led to a serious deterioration of public finances both in the EU and in Bulgaria. For only two years (2020-2021), the government expenditures under the CFP increased by 17%, and in the context of this new reality, the tax instruments the executive power has at its disposal to counter the crisis can be sought in two dimensions: the first one concerning the regulation function of taxation in the process of conducting tax policy in the conditions of an economic crisis, and the second one - related to the need to finance anti-crisis measures for the implementation of which an essential source of funds are the fiscal receipts in the form of taxes in the state treasury. In this regard, the study of the economic and social effects of the Covid-19 pandemic on tax revenues in Bulgaria is of high relevance not only for our country, but also for our European partners as Bulgaria contributes to and participates in the allocation of the European funds (Aleksandrova & Ismailov, 2021). This is performed by evaluating the impact of a system of indicators on tax revenue receipts in Bulgaria based on a built linear regression model; consistent quantitative measurement of the relationship between the dependent variable (total tax revenues in Bulgaria) and selected macroeconomic indicators; quality verification by checking the adequacy of the model, assessing the stochastic accuracy and determining the statistical significance of the parameters. Based on the results, a linear trend model was constructed to forecast total tax revenues of Bulgaria for the next 12 periods. Quarterly data for a period of 20 years (2001Q1 – 2021Q4) obtained from NSI – Bulgaria are used, and the indicators, measurable in BGN, are presented at prices from 2015, with a view to minimizing the effects of the inflation rate. The trend modeling is also based on the prices in 2015.

3.2. Results and Forecast evaluation

Having examined the financial and fiscal measures to support households, businesses and public authorities to overcome the crisis, this part of the study focuses on presenting the results used to assess the impact of a system of indicators on tax revenues in Bulgaria. The parameters in the linear regression model were estimated using the Least Square Method. The linear equations describing the relationship between the dependent variable (on the vertical axis) and the factor variable (on the horizontal axis) are graphically presented in Figure 1(a–j). The estimation of the parameters shows a negative relationship between the dependent variable (total tax revenues) and the factor variable (GDP), namely that during the reviewed period (2001Q1 – 2021Q4) a decrease in GDP by BGN 1 billion has generated an average increase in total tax revenues of BGN 0.428 million for each quarter. The impact of the unemployment factor is also negative: its increase by 1% has given an average decrease in total tax revenues by BGN 0.473 million.
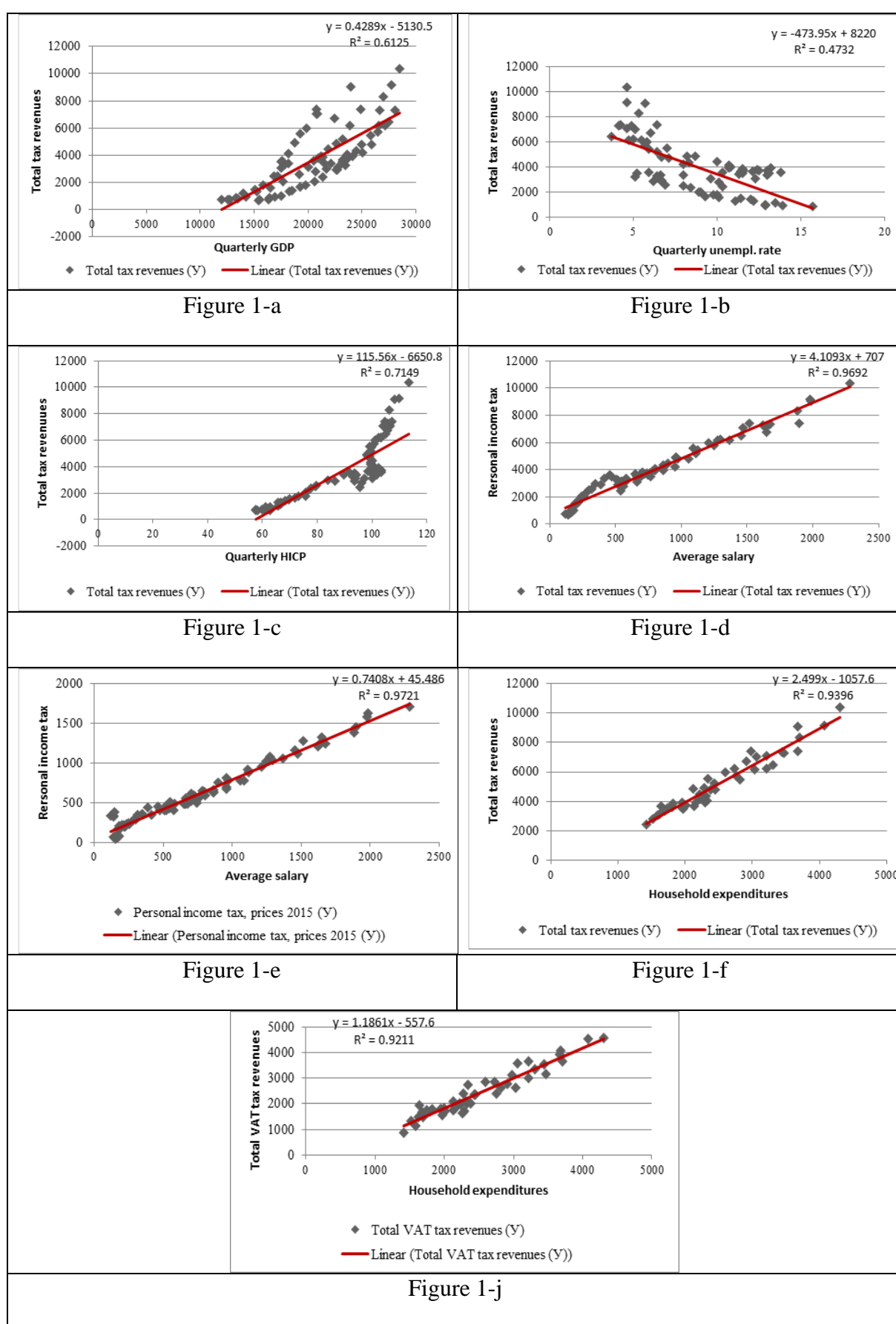
Figure following on the next page

Figure 1: Estimation of the parameters used in the linear regression model
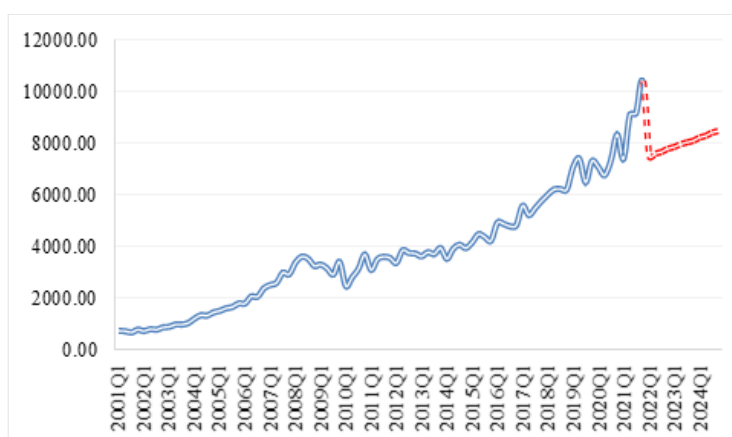
Figure 2: Forecast of the total tax revenues for the period Q12022 – Q42024

With regard to the inflation factor, the relationship established is negative, too, namely that the decrease in HIPC by 1% generates an average increase in tax revenues by BGN 115.56 million on a quarterly basis. A positive correlation is found only with the "average wages and salaries" factor, which was investigated in two directions: impact on total tax revenues and impact on revenues from personal income taxes, as an increase in average wages and salaries suggest, all other terms equal, an increase in the revenues from that particular source. In the first case, it is established that an increase in the average wages and salaries by BGN 1 results in an increase in tax revenues by BGN 4.1 million; in the second - the assumption is confirmed: the same increase in the average wages and salaries generates an increase of tax revenues from personal income taxes specifically by BGN 0.7408 million. Finally, the functional dependence between the average consumption expenditure of households and total VAT tax revenues is examined. It is established that the average reduction of 1 BGN in households expenditures leads to an increase in the total tax revenues by 2.499 million BGN and an increase in the total VAT tax revenues by BGN 1.186 million. The research continues with the econometric analysis of the parameters of the model, the assessment of their stochastic accuracy, the adequacy of the model and verification (the results are presented in Table 2). The parameters are evaluated by calculating the coefficients of correlation and determination, and the average weighted values of each analyzed variable. Since the correlation coefficient takes values in the interval (0-1) (Шопова & Върбанов, 2021), it can be concluded that the dependence between the studied parameters is high. It is highest in the evaluation of the dependence between the average wages and salaries factor and total tax revenues, where 99% of the changes in the dependent variable are explained by changes in the average wages and salaries factor. The lowest is the determination between the unemployment rate factor and tax revenue factor, where 47% of the changes in the dependent variable are explained by changes in the HIPC. The hereto presented and analyzed results pertaining the impact of the selected indicators on tax revenues in Bulgaria logically bring forth the issue of their development in future. The deteriorating socio-economic situation as a result of intensified inflationary processes, the ongoing military actions on the territory of Ukraine, the uncertainty regarding the incidence of the COVID-19 infection after the summer of 2022 and the unstable political situation in Bulgaria put the stability of public finances to the test, and logically raise the question of how long it will take our country to recover. The trend in tax revenues for the next 12 periods can be forecasted using an instrument of the economic analysis – the linear trend model. For the purposes of our research, the trend model with estimated parameters covering the period (2001Q1 - 2021Q4) takes the form: $\hat{Y} = 10.9 + 87.9 * t$ and based on it, a forecast is made for the change in the dependent variable (total tax revenues at 2015 prices) from the time factor.

The trend model, which is graphically presented in Fig. 2, shows a continuing trend towards growth in total tax revenues in the years 2022, 2023 and 2024, of a predictable value of BGN 8,451.7 million at 2015 prices in the last period (2024Q4). The results confirm the expectations for a smooth recovery of the Bulgarian economy in the post-Covid period, if, analogously to (Ioana-Laura, 2021) tax revenues are considered as a barometer for economic activity. A closer look at the projected data, however, reveals a very significant problem, namely – a decline in the total tax revenues in the medium term. Taking into account the current socio-economic situation and the need to undertake inflation-compensating fiscal measures, most of which are of an expenditure nature, the Bulgarian government should focus its efforts on increasing the collection of tax revenues rather than on deficit budget financing. The incorrect policy of public debt management risks pushing our country into a debt spiral, similar to Greece and Italy, the effects of which are extremely severe (Zahariev, et al., 2020a). The stochastic error shows the limits in which the parameters of the model vary and involves the calculation of the mean (μ) and a maximum stochastic error (Δ), and a confidence interval for each of the parameters of the econometric model that we verify (Naydenov, Boshnakov, & Chipeva, 2020). Stochastic error estimates are made at a 95% confidence level, and the range over which each parameter is varied is determined by the respective lower and upper bounds. The interpretation of the results for the GDP factor is as follows: at a confidence level of 95% that the parameters a (GDP) and b (total tax revenues) vary between (-7064.467) – (-3196.493) million BGN, and (0.157) – (0.341) million BGN respectively. The rest parameters are interpreted in an analogous way. The verification continues with determining the adequacy of the econometric model. This is done to establish how well the model describes the investigated dependence. For the purposes of statistical analysis, the explained and the unexplained variance, the theoretical (*Ft*) and the empirical (*Fem*) characteristics describing the relationship between the phenomena are calculated. Based on this this, two hypotheses *H0* and *H1* are tested. The results of the calculations show that *Fem* is greater than *Ft* which means acceptance of Hypothesis 1 (*H1)* for each of the studied indicators. In this sense, it can be argued that at a 95% confidence level, the model correctly describes the relationship between the two phenomena (Table 2). The testing for the statistical significance of the parameters is the last stage of the verification of the econometric model. It establishes whether the corresponding parameters are statistically significant and different from 0, which allows their subsequent interpretation. It is necessary to check again 2 hypotheses: *H0* and *H1*. The results of the calculations show that *Tem* exceeds *Tt* which means acceptance of Hypothesis 1 *(H1)* for each of the studied indicators. In this sense, it can be argued that at a 95% confidence level, the parameters of the model are statistically significant and can be further interpreted for the purposes of the study (Table 2).

Indicators	Evaluation of the parameters					
	Parameter a	Parameter b	R	R²	Average a	Average b
GDP[1]	-5130,47552	0,42888	0,78262	0,61250	20701,09733	3747,72205
Unemployment rate[2]	8219,96613	-473,95071	0,68790	0,47320	8,77105	4062,91947
HICP	-6650,83351	115,56289	0,84552	0,71490	89,98179	3747,72205
Average wages and salaries[3]	707,00278	4,10928	0,99846	0,99692	739,96346	3747,72205
Average annual wages and salaries[4]	45,48597	0,74079	0,98595	0,97210	739,96346	593,64350
Average consumption expenditure of households[5]	-557,60222	1,18608	0,95974	0,92110	2486,03318	2391,03419
Average consumption expenditure of households[6]	-1057,61393	2,49900	0,99679	0,99360	2486,03318	5154,97923

[1] in million BGN, based on 2015 prices

[2] in per cent

[3] in BGN, based on 2015 prices, dependent variable: total tax revenues

[4] in BGN, based on 2015 prices, dependent variable: tax revenues from personal income taxes

[5] in BGN, based on 2015 prices, dependent variable: tax revenues from VAT

[6] in BGN, based on 2015 prices, dependent variable: total tax revenues

Indicators	Stochastic accuracy of the parameters							
	μa (95%)	Δa (95%)	Lower limit	Upper limit	μb	Δb	Lower limit	Upper limit
GDP[7]	986,72813	1933,98714	-7064,46714	-3196,49286	0,04677	0,09166	0,15734	0,34066
Unemployment rate[8]	540,16169	1058,71691	7161,28309	9278,71691	58,12950	113,93382	-587,88382	-360,01618
HICP[9]	2611,27410	5118,09723	-11768,89723	-1532,70277	28,55297	55,96382	59,59618	171,52382
Average wages and salaries[10]	73,87680	144,79852	562,20148	851,79852	0,08090	0,15857	3,95043	4,26757
Average annual wages and salaries[11]	12,65729	24,80829	20,67171	70,28829	0,01386	0,02717	0,71363	0,76797
Average consumption expenditure of households[12]	132,34895	259,40395	-817,00395	-298,19605	0,05118	0,10030	1,08570	1,28630
Average consumption expenditure of households[13]	241,51155	473,36263	-1530,96263	-584,23737	0,09338	0,18303	2,31597	2,68203

Indicators	Adequacy of the model				
	σ1²	σ2²	Fem	Ft (95%)	Adequacy
GDP[14]	56211067,74256	3051769,63357	18,41917	3,95739	**YES**
Unepmployment rate[15]	160765863,35258	2418365,49652	66,47707	3,97023	**YES**
HICP[16]	1081609572,42347	18288618,32284	59,14113	3,95739	**YES**
Average annual wages and salaries[17]	406067854,39906	157415,61454	2579,59069	3,95739	**YES**
Average annual wages and salaries[18]	13198612,28704	4620,75623	2856,37494	3,95739	**YES**
Average consumption expenditure of households[19]	34302995,31743	63867,45175	537,09666	4,05175	**YES**
Average consumption expenditure of households[20]	152298334,58181	212673,97975	716,11174	4,05175	**YES**

Indicators	Verification						count
	Tem (a)	Tt (a) 95%	Verification a	Tem (b)	Tt (b) 95%	Verification b	
GDP[21]	5,19948	1,66365	**YES**	9,17033	1,66365	**YES**	84
Unemployment rate[22]	15,21760	1,66571	**YES**	8,15336	1,66571	**YES**	76

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[7] in million BGN, based on 2015 prices

[8] in per cent

[9] in per cent

[10] in BGN, based on 2015 prices, dependent variable: total tax revenues

[11] in BGN, based on 2015 prices, dependent variable: tax revenues from personal income taxes

[12] in BGN, based on 2015 prices, dependent variable: tax revenues from VAT

[13] in BGN, based on 2015 prices, dependent variable: total tax revenues

[14] in million BGN, based on 2015 prices

[15] in per cent

[16] in per cent

[17] in BGN, based on 2015 prices, dependent variable: total tax revenues

[18] in BGN, based on 2015 prices, dependent variable: tax revenues from personal income taxes

[19] in BGN, based on 2015 prices, dependent variable: tax revenues from VAT

[20] in BGN, based on 2015 prices, dependent variable: total tax revenues

[21] in million BGN, based on 2015 prices

[22] in per cent

HICP[23]	2,54697	1,66365	**YES**	4,04732	1,66365	**YES**	84
Average wages and salaries[24]	9,57002	1,66365	**YES**	50,79317	1,66365	**YES**	84
Average annual wages and salaries[25]	3,59366	1,66365	**YES**	53,44434	1,66365	**YES**	84
Average consumption expenditure of households[26]	4,21312	1,67866	**YES**	23,17693	1,67866	**YES**	48
Average consumption expenditure of households[27]	4,37914	1,67866	**YES**	26,76025	1,67866	**YES**	48

Table 2: Results of regression analysis and model verification
(Source: Authors calculation, based on NSI database)

4. CONCLUSION

The unprecedented socio-economic reality the mankind, businesses and executive powers faced, resulted in the slowdown of economic activity worldwide, including in Bulgaria. The difficult situation called for the adoption of an anti-cyclical strategy to overcome the economic consequences of COVID-19 in Bulgaria. The latter are measured by a slowdown in economic activity and deterioration of the main macroeconomic indicators (budget deficit to GDP; industrial production index; services turnover; import and export of goods and services, etc.). The administrative measures implemented to mitigate the crisis in Bulgaria at the national level, together with the financial support from the EU through the various instruments and programmes (not incl. the National Recovery and Sustainability Plan), aiming to provide for fiscal stimulus, are estimated at over 4% of the GDP of the country. As a result of the conducted research, all support measures in force in the country in the period 2020-2021 were classified by the criteria "organizational form", "type of the measure" and "funding authority". The measures taken are found to be comprehensive in terms of the targeted sectors, which contributes to the stabilization of the business environment and governance in the context of COVID-19 and post-Covid development. The socio-economic effects of the pandemic on total tax revenues in Bulgaria were also analyzed, and, based on the econometric analysis, a strong dependence was established between the resultative value (receipts from tax revenues) and a system of indicators. The forecast evaluation of the changes in tax revenues, presented in the last part of the study predicts a positive trend in future, but at the same time raises some important questions regarding strengthening the recovery process in the context of the new situation. The authors express an opinion regarding the need for subsequent fiscal support and public investments, including the the funding provided by the European Union via the NRSP, which would contribute to the achievement of fiscal stability in Bulgaria in the medium term.

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[24] in BGN, based on 2015 prices, dependent variable: total tax revenues
[25] in BGN, based on 2015 prices, dependent variable: tax revenues from personal income taxes
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STUDENT NEEDS ANALYSIS AS PART OF HIGHER EDUCATION MANAGEMENT: A FOCUS ON ENGLISH FOR SPECIFIC PURPOSES

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ABSTRACT

Over the last two decades, higher education institutions (HEIs) have been faced with serious challenges: globalisation, greater competition, internationalisation, an unprecedented pandemic, rapid emergence and wide spread of new technologies in business and daily routine as well as in academic work, new generations of learners and new needs of the business. In this context, education management and higher education management in particular become of vital importance for all stakeholders. Policy makers have to take new realities into consideration, the business and public administration need qualified personnel with the 21st century knowledge and skills that contribute to sustainable development, HEIs need competitve strategies for educational management and students expect to be educated in a way that will enable them to function successfully in a professional environment and make a career in any organisation worldwide. Being the lingua franca of the world, English is a must along with the knowledge of one or, preferably, two other foreign languages. The impact of English for specific purposes (ESP) on student career prospects is essential for employers tend to hire people who are able to join as full-fledged team members with all necessary qualifications. Hence, to offer optimised academic courses in ESP, academic policy makers and managers have to implement strategies providing for effective language acquisition based on learner needs analysis along with an extensive study of the educational and professional situation. The report presents the results of comprehensive research of student needs analysis with a focus on universities offering programmes in the fields of economics and socio-political studies in Bulgaria and worldwide. It deals with the implications for HEIs and makes recommendations on the improvement of ESP syllabi and materials design.
Keywords: English for specific purposes, higher education management, ESP needs analysis

1. INTRODUCTION

Aiming at providing competitive and cutting-edge education, higher education institutions (HEIs) have to take into account all major challenges and trends of global society along with the specific features of the new generations of learners and workforce demand. Within this context, it is therefore a must to develop programmes incorporating novelties and based on the needs of all stakeholders in the field of higher education. Hence it is vital to investigate the needs of the business, educational policy makers and managers, students. The needs should be studied with regard to the expected knowledge and skills a qualified graduate must acquire at university and involve all academic subjects. Currently, it is common practice in Bulgaria to study the needs of stakeholders on formal and informal occasions such as professional exchange of experience and observations, scientific and social forums, meetings of the business, administration and academia. There is research focused on the particular needs of students with regard to their preparation for a professional career, but it does not provide extensive data in terms of overall and subject specific competences. As a result, stakeholder satisfaction from higher education is not complete with programmes and syllabi requiring improvements. This is the rationale behind the project the author started with a team from the same university. It aims to investigate student needs with regard to the honing of student functional communicative competence in English, i.e. to the study of English for specific purposes (ESP).

Ideally, similar needs analysis related to the rest of the academic subjects taught at HEIs can contribute to an in-depth investigation bringing insights into the current social and educational situation and leading to a genuinely engaging and motivating educational process. In addition, the application of interdisciplinary approaches and techniques can bring a synergistic effect and enhance learning optimisation and student achievements thus resulting in a more effective educational management and higher quality of academic training.

2. NEEDS ANALYSIS IN ESP
2.1. ESP
After World War II, English became the lingua franca on the globe and English for specific purposes has notably been in demand since then due to social and economic development. Different industries and different businesses have different needs and specifics which results in different requirements in terms of ESP materials, competences, course duration, learners. Furthermore, throughout the years and with the advent of new information and communication technologies (ICT), and advance in psychology, linguistics, methodology of teaching and other sciences, new methods and approaches have been introduced and classrooms have changed. Strevens (1988) defined ESP using absolute and variable characteristics. According to him, the former include the satisfaction of specific learner needs, specific content, a linguistic focus on this specific content and a comparison with English for general purposes. The latter are the teaching of ESP based on a certain pre-defined methodology and limited within the specific skills to acquire. In 1997-1998, this common definition was modified by Dudley-Evans and St. John as follows:
"Absolute characteristics: ESP is designed to meet specific needs of the learner, makes use of the underlying methodology and activities of the disciplines that it serves, is centred on the language appropriate to these activities in terms of grammar, lexis, register, study skills, discourse and genre.
ariable characteristics: ESP may be related to or designed for specific disciplines, may use, in specific teaching situations, a different methodology from that of General English" (Dudley-Evans & St. John,1998, pp. 4-5).

Broadening Strevens' definition, Dudley-Evans and St. John assumed that ESP is not necessarily related to a specific discipline and can also be taught to high school students. Hutchinson and Waters (1987) provided an expanded definition and stated that ESP is "an approach to language teaching in which all decisions as to content and method are based on the learner's reason for learning". Defining ESP involves classifying its types. Carter (1983) proposed a classification including three basic types of ESP: English as a restricted language, English for academic and occupational purposes, and English with specific topics. Hutchinson and Waters (ibid.) expanded the second type and accepted that there is no great difference between academic and occupational English. Having defined and classified ESP, researchers focused on the features that distinguish ESP courses from General English (GE) courses. Thus Carter (1983) saw authentic material, purpose-related orientation and self-direction as the most common characteristics of ESP courses. Using authentic materials and situations to build an authentic response, accomplishing the educational purposes of the university and the business by involving simulations, role-plays or other teaching techniques, and providing for the transformation of the learner into a proficient user contribute to the academic ESP course effectiveness and the honing of functional communicative competence. Similarly to courses in GE, ESP courses must also be designed by taking into consideration the features of the new generations, called "digital natives" by Prensky (2001). Due to the wide spread of new technologies, the digital natives differ from their parents and grandparents in the way they perceive, interact, acquire and study.

These generations are, therefore, naturally inclined to learn by using computers, mobile phones, other modern devices, social media along with intensive interaction with the teacher and peers and with greater responsiveness when learning and assessment involve interactive tasks – tasks designed to engage all learner senses, imagination and creativity, and at the same time including the acquisition of not one, but some or all linguage skills (Stefanova, 2021). This results in enhanced motivation and greater engagement in ESP acquisition and any learning activity in general and leads, in turn, to improved student achievements and course effectiveness (De Bot et al., 2005). In addition, learning and professional realisation are facilitated by the acquisition of the 21st c. skills. These skills are the rediscovered conventional skills that people need for their collective and individual success (Roterham and Willingham, 2009) in a knowledge-based economy (Voogt & Roblin, 2010; Scott, 2015; Chalkiadaki, 2018). According to Binkley et al. (2012), they include "creativity and innovation, critical thinking/problem solving/decision making, learning to learn/metacognition, communication, collaboration (teamwork), information literacy, ICT literacy, citizenship (local and global), life and career skills, and personal and social responsibility". Furthermore, as Stefanova (2021) pointed out "the demand for the 21st century skills can be met by offering new teaching instruction more focused on the learner and in line with new global developments and fostering student engagement and motivation to learn" (Stefanova, 2021, p. 21). This leads us to Glenn's assumption that "Net Geners need self-directed learning opportunities, interactive environments, multiple forms of feedback, and assignment choices that use different resources to create personally meaningful learning experiences" (Glenn, 2000, p. 6). and once again underlies the importance of the implementation of new teaching and learning approaches.

2.2. Needs analysis in ESP

Due to its essence, ESP suggests a myriad of tailored courses because each and every course varies in its parameters in order to meet particular, specific, needs. Organisations have to consider the specific circumstances that make them require specialised knowledge and skills in English, for instance age, level of English, qualification and needs of particular employees/departments, industry specifics, time, culture, organisation needs, current situation in the business/ country/the world, etc. For an ESP practitioner, therefeore, it is essential that they have reliable information about the requested course, so that it is effective and leads to the achievement of the organisation's goals. Worldwide, needs analysis in ESP has been focused on various facets of the learning process depending on the particular interest of researchers and institutions as well as on the specific national or economy sector context. It has been among the central topics of research since the 1970s and with the underlying contributions of Richterich (1972, 1983) and Munby (1978). For Richterich needs analysis means "compiling information both on the individual or groups of individuals who are to learn a language and on the use which they are expected to make of it when they have learned it" (1983, p. 5). In 1978, Munby published his book "Communicative Syllabus Design" where he presented an exhaustive treatment of needs analysis. He distinguished nine components of needs analysis with relation to learner expectations and requirements in terms of learner functional communicative competence: participant, purposive domain, setting, interaction, instrumentality, dialect, target level, communicative event, and communicative key. The focus was on the information that reveals the profile of learner needs. Thus Munby developed a model in which the initial identification of the target ESP learner needs leads to the selection of the teaching method, techniques and procedures that will enable learners to achieve the goals of the ESP course and will meet their needs. Chambers (1980) emphasized the fact that in needs analysis there is a relation between the establishment of learner needs and their satisfaction based on the analysis of the communication in the target situation.

In the case with academic ESP courses, it is noteworthy that if needs are "understood as specific requirements for the foreign language, then the vast majority of learners do not have any. They are deemed to require what the syllabus offers them, and the syllabus is likely to be closely related to the examination, which is a highly realistic "need" for the majority of learners" (Dickinson, 1991, p. 88). This is a profound implication that should be taken account of when preparing a course syllabus because of its relation to learner motivation and engagement. Another significant ascertainment with regard to the connection between ESP needs analysis and successful ESP learning was made by Tahir: "the incorporation of learners' future needs – what is known as „real world" needs – and the development of learner ability to transfer language knowledge to novel situations, together with the usage of acquired skills in real life communication are considered to be vital parts of ESP syllabus" (2009, p. 117). Furthermore, it is relevant to mention how West (1997) added to needs analysis the target situation, the current situation analysis, discourse analysis, learning environment analysis and learner factor analysis with a focus on learner motivation, perception of their needs, learning style/s. Similarly, Dudley-Evans and St. John (1998) saw needs analysis as the analysis of the information about the learner that includes details about learner's professional context and specifics of the communication at work, personal background, level of English, educational needs, lacks, expectations of the ESP course and means analysis. They described it as containing the following elements:

- "A. target situation analysis & objective needs
- B. wants, means, subjective needs
- C. present situation analysis
- D. learners' lacks
- E. learning needs
- F. linguistic and discourse analysis
- G. what is wanted from the course
- H. means analysis

where A includes professional information about learners: what they will be using English for; B includes personal information about learners: attitude to English, previous experiences. C includes English language information about learners: their current skills and experiences in language use; D defines the gap between C and A; E includes language learning information: effective ways of learning the skills and the language; H includes information about the environment in which the course will be run" (Dudley-Evans & St. John, 1998, p. 125).

Hutchinson and Waters (1987) made an essential distinction between target needs and learning needs. The former meaning the what to do in the target situation and the latter meaning the what to do in order to learn. A further classification was made of target needs into necessities – determined by the target situation and including what the learner needs to function in this situation; wants – associated with the learner's subjective perception of what their needs are; and lacks – what the learner does not know but needs in order to function successfully in their professional context.

3. INVESTIGATING THE ESP NEEDS OF THE STUDENTS OF ECONOMICS AND SOCIO-POLITICAL STUDIES

The project "English for a successful career: A study of the ESP needs of the students majoring in economics and socio-political studies" is a detailed investigation of the needs of university students aimed at establishing the current needs of the modern learners in order to optimise the ESP courses at the University of National and World Economy (UNWE) in Bulgaria. It includes a survey of students from UNWE as well as from local and foreign universities with a similar

profile. The survey was based on an online personal structured interview including 28 questions – open or multiple-choice ones with a five-point Likert scale where applicable for the latter and and was conducted in two stages. The first or pilot stage was focused on UNWE students while the second was focused on students from other universities in Bulgaria and from foreign universities. The questions were aimed at obtaining detailed information about students' needs, wants and lacks with regard to the acquisition and improvement of each language skill as well as with regard to the optimisation of the educational process by enhancing learner involvement. This is why, in addition, the survey included questions about respondents' grades from their matriculation exam, their perceptions of their assessment at school and university, willingness to co-create with the teacher, motivation for ESP acquisition, perceptions of course parameters. To collect more data and involve other stakeholders, a survey was held with lecturers in language and/or subject at UNWE during the second stage. The breakdown of respondents is as follows:

- 1106 students
    1) 939 Bulgarian students: 567 from UNWE and 372 from 6 other local HEIs
    2) 167 foreign students from 10 countries: Albania, Northern Macedonia, Serbia, Lithuania, Latvia, Brazil, China, Spain, Portugal and Romania
- 32 UNWE lecturers

So far, the data from the survey of Bulgarian students has been processed thoroughly, which is why the results presented here reveal the attitudes and perceptions of local students. Nevertheless, the research provides insights into the current learner attitudes and opinions along with the personal and professional information about the respondents and thus it is possible to draw conclusions and make recommendations that can contribute to the optimisation of the ESP courses and academic education in general. Generally, in language teaching there are four key skills to acquire: two receptive – listening and reading, and two productive – speaking and writing. Therefore in English for specific purposes it is critical for the learner's career to acquire these skills with a focus on learner's particular professional area. Within each skill there can be distinguished subskills such as writing business letters, writing reports, describing graphs or preparing business presentations. All of them are important, but some are perceived as crucial, while others – not. Similarly, some of the subskills are easier to acquire and others – not. Whether lecturers and students have the same perception in this regard is to be established after all data has been processed, but at this stage the author can analyse the data in the four graphs below based on her own personal experience and observations. It seems that students underestimate some subskills. In listening, describing specialised data and trends is considered critical by business experts and language teachers, whereas students find it least important for them to acquire. In speaking, presenting positions, summarising, describing trends and giving presentations are perceived by students as not that necessary compared to negotiating, participating in official talks or discussing business matters. Obviously, presenting positions, summarising and describing trends are not perceived as valuable components of speaking allowing a learner to negotiate with partners, discuss at work or participate in official talks, i.e. the relation between subskills is not realised and hence not appreciated properly. With presentations, the case differs because one explanation of their underestimation can be the fact that Bulgarian schoolchildren prepare and give presentations and later on, as students, they might find giving business presentations similar to their school ones and associate them with something familiar they are experienced in. In writing, presentations, describing trends, summarising and report writing are perceived less essential by respondents.

The most relevant listening skill: understanding
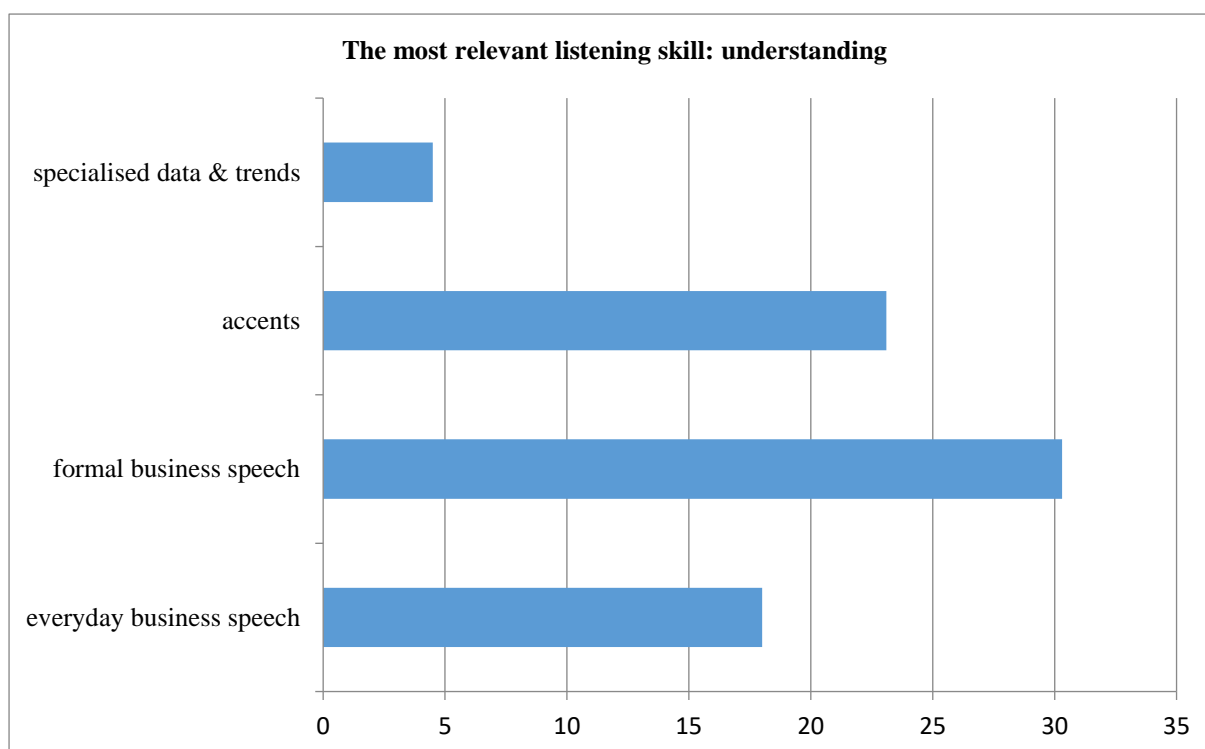
Graph 1: The most relevant listening skill

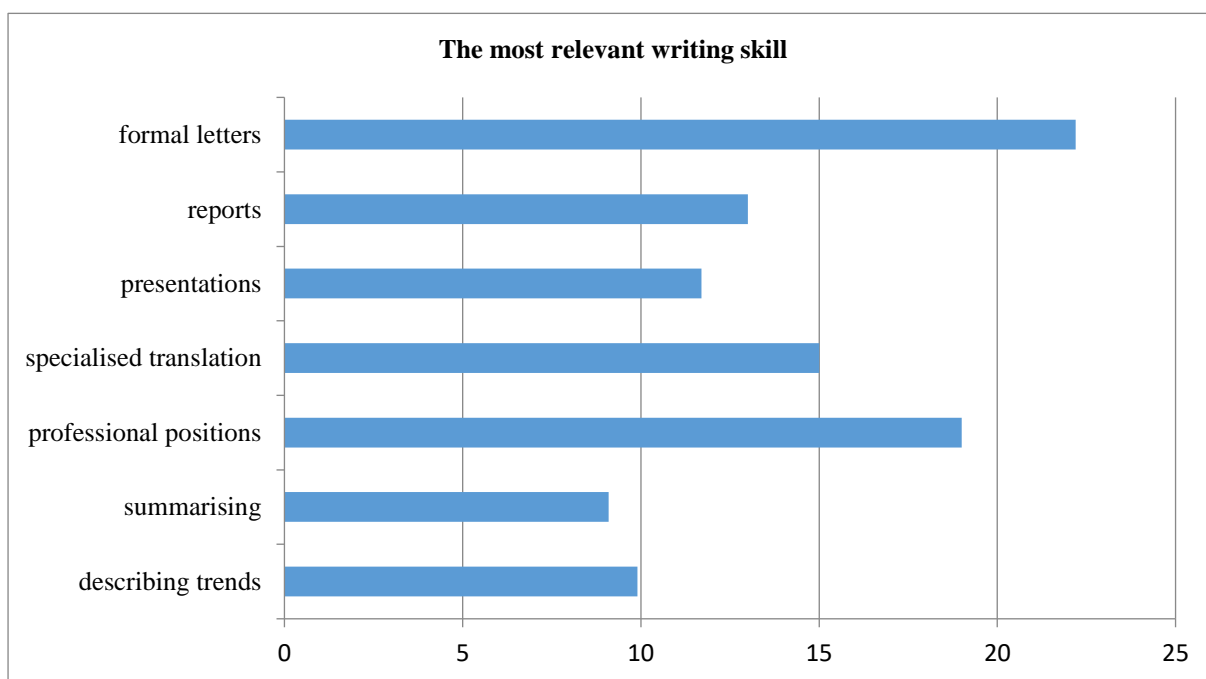**The most relevant reading skill**
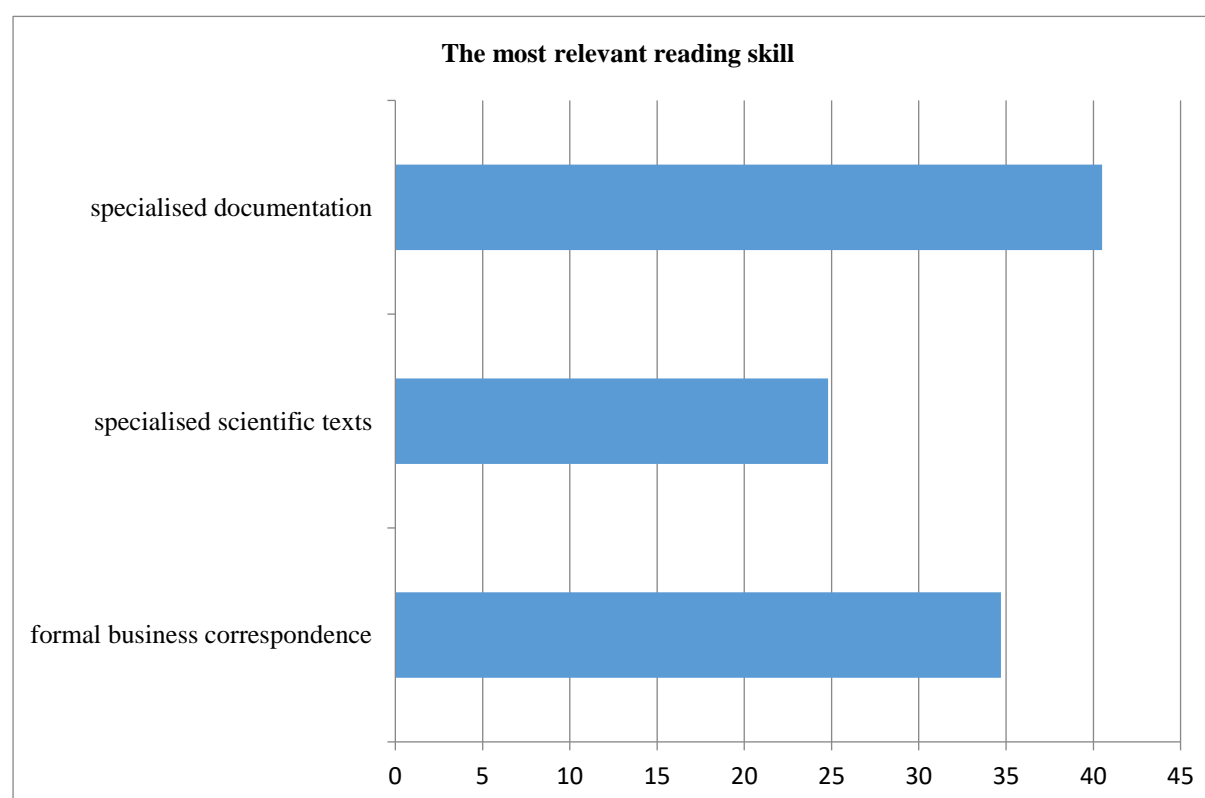
Graph 2: The most relevant reading skill

Similarly to speaking, this finding can be explained with school experience. Another explanation can be respondent's particular specialty resulting in the opinion that the subskill may have little or not substantial impact on respondent's success at work in the future.
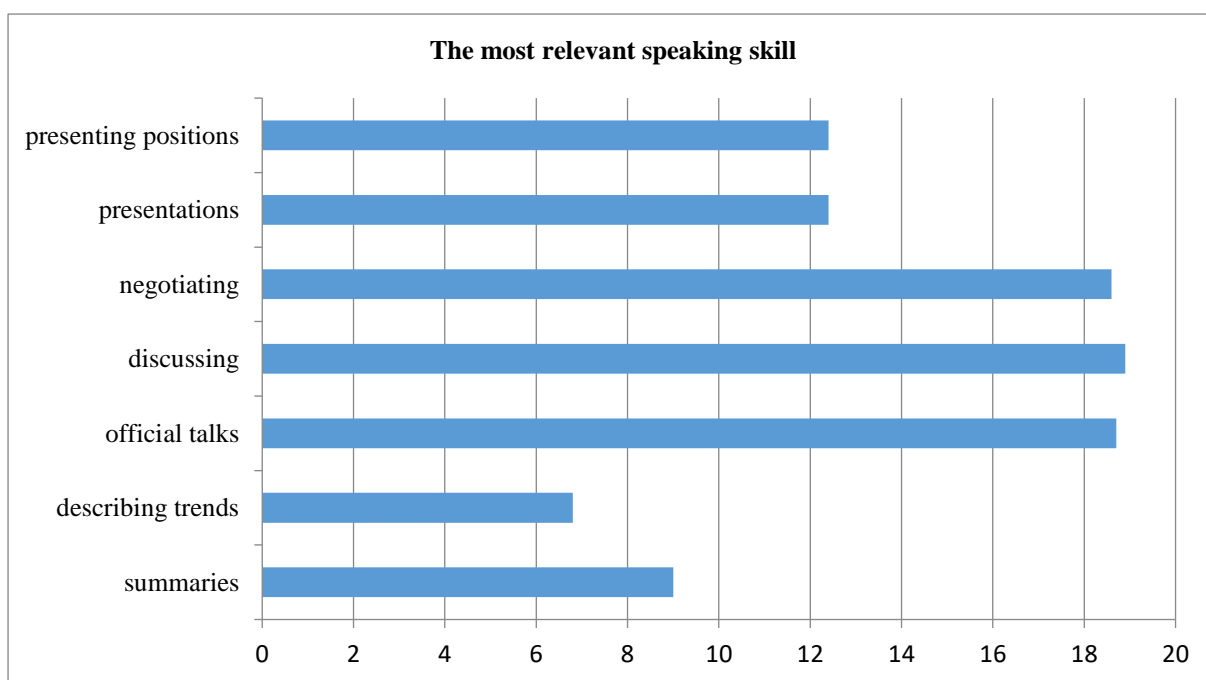
Graph 3: The most relevant speaking skill

Graph 4: The most relevant writing skill

In terms of the most difficult skill to acquire, respondents have indicated specialised speaking (42,4%) and writing (26,7 %), both productive skills, i.e. with learners more actively involved in communication compared to receptive skills when they are more passive due to skills specificity. As far as learner motivation and engagement are considered, students' answers reveal some anxiety or fear of expressing stronger interest in co-creating with the teacher and getting more actively involved in the learning process by using their own creativity and ideas unlike the comments made in class: "Why don't we…?", "Can't we do it in a more interesting way/using the Internet…?", "I prefer …".

My expectations are that the academic course in English will:	Strongly agree %	Agree %	Neither agree, nor disagree %	Disagree %	Strongly disagree %
include interactive tasks that will raise my interest and motivation for studying	49,1	24,7	17,3	5,8	3,2
include work on the Internet and on the social media platforms that will raise my interest and motivation for studying	47,4	24,6	18,1	6,3	3,6
provide the opportunity to suggest specialised topics that will raise my interest and motivation for studying	42,8	26,2	20,6	6,5	3,9
provide the opportunity to discuss with both the lecturer and my colleagues the opportunity to optimise the academic course that will raise my interest and motivation for studying	41,3	26,9	22,0	6,2	3,5

Table 1: Respondents' attitudes in terms of engagement and motivation

In general, it can be concluded that the presented data can also be further explained with the fact that very often students do not realise the explicit relation of the material taught and the situations in real-life professional context. Another implication is related to the number of course hours. During the data processing, a correlation was established between respondents' motivation and the number of hours – if the number of hours is perceived as insufficient, students feel no motivation to make efforts to acquire ESP because the time will not be enough to acquire all they consider important. Having revealed some of the research facets, improvements can be recommended in order to motivate students more strongly and to enhance their performance with reference to the discrepancies observed between respondents' and teacher's perceptions in terms of the specialised skills acquisition: adjusting course parameters by offering a more varied and careful selection of materials, providing for greater involvement by pointing to the relation between the different knowledge and skills taught and the occupational situation relevant for the learners' profile (e.g. public administration, political studies, management, banking, etc.), introducing interactive tasks based on interdisciplinarity, encouraging teamwork and peer assessment as a way to foster learner autonomy and critical thinking, implementing new technologies and teaching techniques in the classroom, revising and updating course content.

4. CONCLUSION
Having considered ESP specifics and ESP needs analysis in the tertiary sector and UNWE in particular, recommendations have been made with regard to ESP courses locally and globally. The same recommendations can be applied to subject courses in economics and socio-political studies in order to enhance the overall quality of the academic educational process.

Needs analysis for each subject similar to the one for academic ESP courses seems a must for an HEI striving to offer competitive and high-quality education and research. Improvements similar to those for the ESP courses and made to each subject course can increase learner engagement, stimulate teamwork and active participation in the creation of content and encourage better student performance. The deep analysis of course content, syllabi, methods and assessment can result in enhanced course quality and stronger student motivation to learn. This, in turn, can lead to a greater number of students and improved university image. Educational policy makers and managers could take advantage of this situation and strengthen institutional international relations as well as exchange and expand along with the use of this impetus for enhanced research activity and facilitated cooperation with the business. Forms of cooperation involving students can facilitate employers in selecting young and promising professionals and give undergraduates the opportunity to grasp the essence of a trade and acquire first-hand experience in their specialty. Thus the strengthened university - business exchange can produce other initiatives of mutual interest and progress along with improved theory-practice relations. Involving all stakeholders and satisfying their needs will ultimately add value to society in a knowledge-based economy.

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SHADOW DIGITAL TECHNOLOGIES – THREATS TO NATIONAL SECURITY

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ABSTRACT

Shadow Digital Economy (SDE) is a sector of economic relations covering all types of production and economic activities that, in their focus, content, nature and form, contradict the requirements of the law and are being carried out contrary to state regulation of the economy and bypassing control over it. The paper provides an interaction model between the main segments of the shadow digital economy and an analysis of statistical information characterizing these segments. The paper provides an analysis of the category "Shadow Digital Technologies" (SDT), their components such as information systems, users' activity or inactivity, basic processes and rules, as well as the formation of new challenges and threats to the security of the individual, society and the state. Particular attention is paid to the transition elements: from shadow digital technologies to a shadow digital economy - the economic component has always been the final goal of criminal activity. The authors note that SDT and SDE are socio-economic phenomena, they are a set of developed, but underground markets for information and software products and services, have an ultra-high intellectual potential, a large amount of material and financial resources, and huge economic opportunities. By their structure, these markets are heterogeneous both, in terms of volumes and prospects for causing damage to the individual, society and the state. The paper concludes that the application of new digital technologies in the economy brings new challenges and risks. It can be stated that digital services control level decreases while opportunities for the implementation of a wide range of illegal actions for information leakage increases. Completely new threats appear, and these threats are related to the explosive growth of the importance of social networks in the life of society and the introduction of new technologies, such as artificial intelligence, virtual/augmented reality, the Internet of Things (IoT) and the influence on the operation of equipment (for example, household appliances, cardiostimulators, etc.). At the end of the article, we formulated the main risks related to implementation and adoption of cryptocurrencies by financial institutions. The review of the threats confronting concepts would allow states to stimulate the introduction and development of new financial technologies in a controlled manner by once side, as well as mitigating potential risks, by the other side.
Keywords: *Shadow Digital Technologies, Shadow Digital Economics, Threats, Financial Sector, National Security*

1. INTRODUCTION

The World is rapidly changing under the influence of digital transformation. At the same time new challenges and threats, which may have an unpredictable impact, are being identified. The fourth industrial revolution led to significant changes in the information infrastructure: the introduction of robotic systems, artificial intelligence, autonomous vehicles, AR / VR, transition to remote work, etc.

The COVID-19 pandemic had and is still having its impact on the global supply chain, by generating new threats to information resources, systems and networks [1,2,3]. All this has facilitated a significant increase in the risks associated with the use of shadow digital technologies.

2. SHADOW DIGITAL TECHNOLOGIES

Combating threats to national security and illegal processing of various information forms and content is of a particular relevance in the context of digital transformation and building a digital society and digital economy. A total globalization and an extremely high competitive environment is being created within the economy digitalization process, which requires new qualifications and high-quality education. At the same time, many traditional areas of activity are disappearing or changing their structure. Therefore, along with the benefits of the digital economy, it is necessary to reanalyze known and hidden threats evolved because of the digitalization processes. The 4th Industrial Revolution brought new technologies as artificial intelligence, robotics, autonomous vehicles and other achievements into our lives, which are used not only for social progress. As a result, today's computer crimes structure and characteristics from those that were 20-30 or even 10 years ago in terms of methods, factors and motives. Criminal activities are being transformed, crime itself is moving into the digital environment. Activities of specialized criminal groups (public and private) targeting states and commercial interests in a cybernetic environment also pose a serious danger. The annual Global Risk Reports consistently highlight the risks associated with technological threats such as: cybersecurity failure; digital inequality; IT infrastructure breakdown; tech governance failure; adverse tech advances. According to the results of surveys, the risks associated with cybersecurity have consistently been among the top five most significant for 2012-2020. At the end of 2021, the top ten most significant risks included Digital power concentration (6th place) and Digital inequality (7th place) [4]. The starting point of the SDE is the concept "shadow IT" (Shadow IT, Stealth IT or Client IT). Shadow IT is a currently misunderstood and relatively unexplored phenomena. The concept is present in all types of organizations, state or commercial structures. Various definitions are used, in particular:

1) Shadow IT refers to IT devices, software and services outside the ownership or control of IT organizations [5].
2) Shadow IT represents all hardware, software, or any other solutions used by employees inside of the organizational ecosystem which have not received any formal IT department approval [6].
3) Information Technology (IT) used for business processes is not only provided by the organization´s IT department. Business departments and users autonomously implement IT solutions, which are not embedded in the organizational IT service management. This increasingly occurring phenomenon is called Shadow IT [7].
4) As many leading thinkers have pointed out, technology has brought about the merging of the work life and the personal life. This has lead to the transfer of "consumer" experience on the internet into the expectations for "employee" experience at the enterprise. Thus, we have witnessed a process at which, initially shadow IT, have entered the workspace somehow naturally [8].
5) Employees increasingly use unauthorized technologies at the workplace, referred to as Shadow Information Technology (SIT). Previous Research identifies that shadow technologies are often collaborative systems used by employees to communicate and share content with co-workers, clients, or external partners. Considering that Shadow Information Technology is often a collaborative system, and its usage has the objective of effective and productive completion of work tasks, we propose that this employee initiative, called

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Shadow Information Technology, can stimulate organizational knowledge sharing (KS), which is central to knowledge management practices [9].

6) "Shadow IT" is the term sometimes used to describe the situation when business units buy, own and operate IT resources with little or no assistance from the IT group. Many IT departments consider shadow IT inefficient and a source of risk, and see part of their role as containing its spread. This approach is not only futile but a waste of valuable talent in the workforce [10].

In summary, Shadow IT deals mainly with equipment, devices and software that is installed and operated with no authorization. Shadow IT can get to the user's workplace in two ways. First, technology components are independently installed by the user without control from the relevant department and information security service. The second way is much more difficult and imply the use of technologies for unauthorized software installing. For example, a user receives an email message that has a .doc or .pdf attachment. The developer of this abuse uses social engineering elements and techniques and forces files opening. This action leads to the installation of a special program in the computer's memory, which aims at performing a set of actions, including such as launching appropriate processes in the memory, copying certain information as well as covering up traces of presence. In practice, there are various tools and techniques designed to facilitate unauthorized access to information as personal data, trade and government secrets and so on. Shadow IT itself not necessarily have an objective to damage. A "bad intention" should exit and a final objective which expand the normal lawful behavior. "Shadow Digital Technologies" (SDT) is a larger concept, which includes Shadow IT components such as equipment and mobile devices, software and information systems, etc., as well as users' activity or inactivity, specific processes, activities and rules that govern functioning of Shadow IT components. Thus, bad intentioned humans will always follow diverse interests, for example, access to confidential information in case of in case of confrontations between governments and their intelligence services, disruption of services in case of confrontations between organizations, access to personal data and, finally, earning more money. Logically, SDT is part of the SDE, which uses economic law and principles to achieve its objectives. The Digital Economy involves the unification of classical economic lows and digital technologies. Digital economy facilitates the economic inclusion; however, it may also increase the chances of instability due to systematic risks. Taken together, SDT represents a part and a form of SDE, which can be defined as "a sector of economic relations that encompasses all types of production and business activities that, by their focus, content, nature, and form, are contrary to the requirements of legislation and are carried out contrary to state regulation of the economy and bypassing control over it" [11]. Figure 1 shows a graphical presentation of SDT as part of SDE and both, being part of the legal Economy, but using criminal tools and techniques.

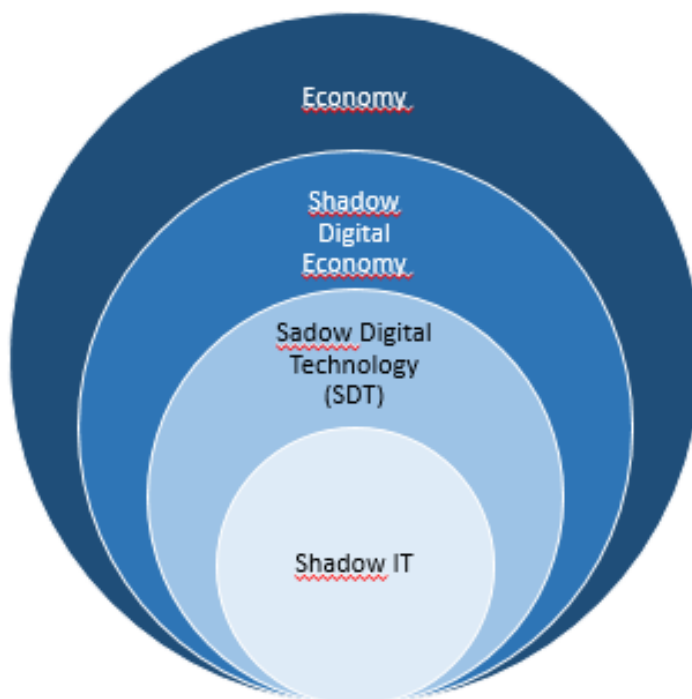*Figure following on the next page*

Figure 5: SDT place and correlation with SDE
(Source: Developed by the authors)

Particular attention is paid to the transition and usage of shadow digital technologies to a shadow digital economy - the economic component has always been the final goal of criminal activity. The authors conducted a study of the connection between SDT and SDE and proposed the key elements of the cybercriminal economy [12]. Thus, using SDT it is possible to cause significant damage to the enterprises and organizations information systems, as well as to information resources owned by States. The high-level interaction relationship between criminals, SDT, SDE and the impacted actors is shown in the following figure.
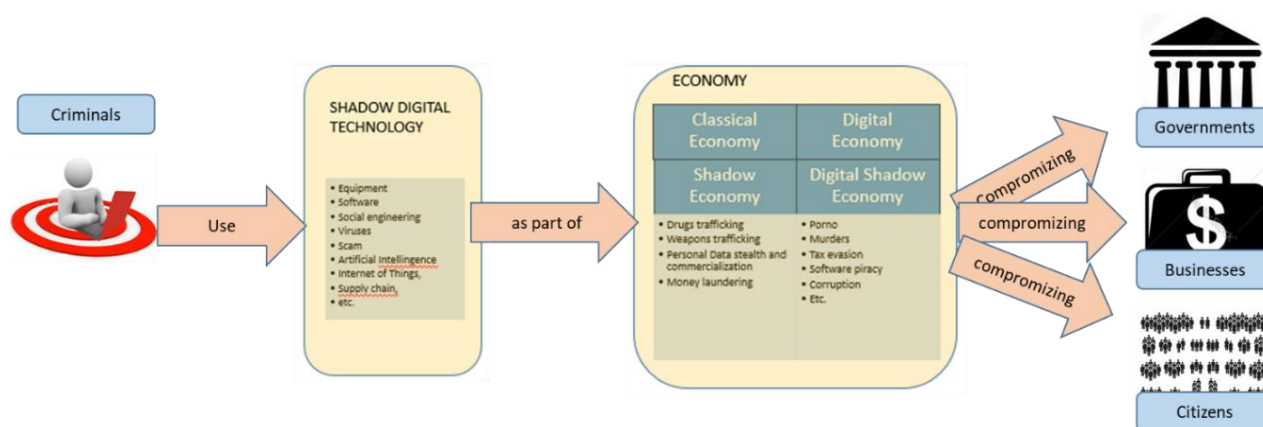

Figure 6: The high-level interaction relationship between criminals, SDT, SDE and the impacted actors
(Source: Developed by the authors)

As we see in the Figure 2, bad intentioned persons/criminals make use of shadow technology to compromise Governments, Organizations and citizens as part of and by using principle of the economy. They "go shadow" by breaking the rules and applying unaccepted, criminal behavior.

3. MODERN FINANCIAL THREATS

The analysis of the latest achievements in the field of information and communication technologies and the practice of combating computer crimes allows us to distinguish two main directions [13, 14, 15]:

1) Technology oriented threats. Most experts and observers predict new threats coming from new technologies (e.g., 5G, the cloud, APIs, IoT/AI-IoT, *aaS providers, blockchain, AI, digital assistants, and smartphones). Additionally, we are less concerned about the nature of the threat (e.g., malware, phishing, denial of service, and password attacks) and more troubled that new technologies bring new vulnerabilities and new methods of cybercrime.

2) Entity oriented threats. These are directed to any: humans, organizations, strategic industries and critical infrastructure, government or alliances. Entities are increasingly being targeted by adopting more new technologies with potentially more vulnerabilities. The attack surface is also increasing due to the pervasiveness of IoT/AI-IoT devices, ever-broadening global hyperconnectivity, and a pivot to remote work. Cyberattacks are more sophisticated with attempts to control computer systems to immobilize, disturb, or control the technology. For example, we may see more weak-link data exfiltration attacks along organizations' supply chains. Unfortunately, the speed and scale of cyberattacks are growing exponentially, resulting in alert fatigue among frontline cyber-defenders.

Strategic developing industries is a specific domain of interest and include areas as integrated circuits (ICs) and software, new-generation networks (internet, digital TV and mobile networks), advanced computing (grid-based and peta/teraflop computer systems), biomedicine, genome research and traditional medicine, spatial applications combining 5G and satellite application (such as meteorological, environmental and geolocations), civil aircraft and advanced engines, AI, 5G and mobile devices, new materials needed in IT, biotechnology and aerospace industries, electric and hybrid vehicles, others. This domain is impacted by both, technological and entity oriented threats. The financial sector as a component of governments' critical infrastructure has been an exclusive domain of advanced technologies and for decades. According to Cybersecurity & Infrastructure Security Agency, the Financial Services Sector includes thousands of depository institutions, providers of investment products, insurance companies, other credit and financing organizations, and the providers of the critical financial utilities and services that support these functions. Financial institutions vary widely in size and presence, ranging from some of the world's largest global companies with thousands of employees and many billions of dollars in assets, to community banks and credit unions with a small number of employees serving individual communities. Realizing the value of the data it is entrusted with, like banking records and personal identifiable information (PII), and the detrimental impact of cyber breaches, this critical sector is seen as a figure in risk. Power outages, natural disasters, pandemic, sabotage, and an increased number of cyberattacks demonstrate the wide range of potential risks facing the financial sector. A major failure of the financial sector represents a huge impact on national security. Being the center of digital transformation, the financial sector has formed a new segment of modern financial markets - fintech. Fintech uses all modern digital technologies: artificial intelligence, big data technologies, distributed registry tools, biotechnologies. At the same time, the most well-known objects of FinTech are cryptocurrency and tokens. Cryptocurrencies, regardless of the attitude of regulatory authorities to them, have become a virtual reality of the financial sector and are actively used to pay for goods and services. Cryptocurrencies create opportunities — from the development of innovative technologies to the creation of new jobs and replenishment of the national budget. Anyone with Internet access and an account can use cryptocurrencies, there is no restriction and can be traded 24/7 all over the world.

The peculiarity of cryptocurrencies is its anonymity and unaccountability of the state that defines a range of risks to society and the state. The growing popularity and especially secrecy aspects attract attention of Criminals. The operation of cryptocurrencies facilitates money laundering; tax evasion, etc. In addition, cybercriminals can hide their identities when trading illegal software, confidential data, and services in digital currencies. Cryptocurrency is the most preferred form of exchange in cases of ransomware and other types of attacks. Moreover, Cybercriminals can hack the cryptocurrency trading platforms itself and steal funds, compromising cryptocurrency accounts, use of crypto-malware, and so on.

4. CONCLUSION

Digital transformation brings new challenges and risks, which are directly related to the expansion of technologies in the economy and private life. Due to complexity of the new technologies options and possibilities to control digital services decrease, the possibilities for the realization of a wide range of illegal actions and the risk of information leaks increases increase. Completely new threats, that are associated with the explosive growth of the technological landscape, appear. More, the high and very high adoption of social networks by the individuals and society facilitates the related risks exploitation. The current concepts, aimed to deal with modern threats, including those related to SDT and, consequently SDE, should be reviewed and rebuilt. The reviewed concepts should include a cardinal amendment of the legislative base and the creation of conditions under which the realization and concealment of all types of illegal activity become not only criminally punishable, but also economically unprofitable. In the absence of any Internet "borders", cooperation at the state, regional and international levels in order to resist cybercrime and cyberterrorism is a mandatory condition. Governments should run programs that can reduce the size of the SDE by running reforms of the financial sector and adapt it to the new reality.

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STATUS OF EMISSIONS OF KEY AIR POLLUTANTS – STRUCTURE, DYNAMICS, FACTOR INFLUENCES AND OPPORTUNITIES FOR REDUCTION

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ABSTRACT

This paper examines the dynamics of the metrics characterizing the key air pollutants and assesses the progress Bulgaria has made. The dynamics of key air pollutants, their relative shares, and structural changes are assessed. Emissions of pollutants into the atmosphere are studied both by types and by emission sources – industrial, fuel and production processes. The main economic sectors that contributed to the total emissions in the period 2011-2020 are investigated. The dynamics of key pollutants for the period 2011-2020 are compared with the dynamics of GDP. Carbon emissions have a dominant share. Opportunities for applying the game theory in carbon trading are presented. The paper uses statistical methods for time series analysis – rates of change, rates of growth, trend modelling based on linear and non-linear models, adequacy tests, trend tests, selection of the most appropriate trend model, etc. The analysis of the structure of pollutants in the air is based on the calculated relative shares of the types of gases in general and by types of sources via calculating the integral coefficient of structural changes and differences, Euclidean distance between two points, etc. The results of this analysis show that the change in the examined metrics for emissions of pollutants in the air is at a slower pace and Bulgaria is significantly lagging behind compared to the other Member States of the European Union.
Keywords: sustainable development, air pollutants, carbon emissions, statistical analysis, trend models

1. INTRODUCTION

Environmental protection is a very important topic on the agenda of modern society, because it affects all areas of human activity, and to achieve real results, it is necessary not only to adopt strategies and policies for the transition and introduction of a green economy, but also to carry out changes in a number of laws and regulatory documents, as well as to provide financially the individual measures for implementing the set goals. In order to successfully transition to an environmentally friendly economy, there should be political consensus and broad public support for the environmental protection policies for current and future generations, popularization of the harm caused by environmental pollution and its impact on human health, the need to preserve biological diversity, pollution prevention and control, ecosystem development and responsible use of resources.

The European Union has a leading role in carrying out environmental protection and climate change policies, and the European Green Deal contains a package of measures aimed at reducing greenhouse gas emissions by 2030 and carbon emissions by 2050. The EU Member States incorporate these goals into their national policies and take measures to implement them, with different results for the different countries. In the present study, the object of research is the harmful emissions in the atmosphere for Bulgaria for the period 2011-2020, and the aim is to analyze their dynamics and structure, with an emphasis on carbon emissions. The tasks set by the authors are:

- To track the dynamics and structure of the emissions of pollutants in the air by types and sources of emission – industrial, fuel and production processes, by applying methods for the analysis of time series and for the analysis and assessment of structural changes;
- To analyze the structural changes of carbon emissions by pollution sources, by determining the Euclidean distance, factor influences and studying the direction of the structural dynamics of carbon emissions in the atmosphere;
- To present opportunities for applying the game theory in carbon trading.

The study is based on official statistical data of the National Statistical Institute and the Executive Environment Agency of the Ministry of Environment and Water for the period 2011-2020. According to the current methodology of the statistical study, the emissions are determined using the balance method based on the following metrics: fuel consumed, calorific value, amount of output produced and inputs of raw materials, as well as emission factors for the relevant pollutants. (NSI, n.d.)

2. ANALYSIS OF THE DYNAMICS AND STRUCTURE OF THE EMISSIONS OF AIR POLLUTANTS

Air pollution is not only a problem of the individual country, in this case Bulgaria, but it is a pan-European and intercontinental problem, since the emitted pollutants are transferred to and worsen the air quality in the neighbouring countries as well. Emissions of harmful substances into the atmosphere are the result of both the economic activity in the country – the industry as a whole, with the leading place being occupied by the fuel and energy complex and transport, as well as emissions generated by households. Air pollutants are substances that are in high concentrations above permissible norms and endanger the environment and human health. The analysis of the dynamics and structure of the emissions of air pollutants is an important part of the monitoring and assessment of the processes, but also a reliable basis for the development and implementation of adequate environmental protection policies. The main air pollutants are sulfur and nitrogen oxides, non-methane volatile organic compounds, methane, carbon monoxide, carbon dioxide, nitrous oxide and ammonia. The trends in their change are analyzed by applying statistical methods for time series analysis – rates of change, rates of growth, trend modelling based on linear and non-linear models, adequacy tests, trend tests, selection of the most appropriate trend model etc. (Ivanov, 2008), (Petkov, 2010), (Slaveva, 2010). During the period 2011-2020, Bulgaria tends to reduce the emissions of air pollutants, with the exception of emissions of nitrous oxide and ammonia. The trend towards a decrease is most pronounced in sulfur oxides emissions, for which the values for 2020 are 9.3 times as low as in 2011. Compared to the values for the previous year, the largest decrease is in 2012 by 49.8%, followed by the decrease in 2013 by 48.9%, and in the following years the decrease is at a much slower rate and the average annual rate of decrease for the period is 22%. The emissions of nitrogen oxides in the atmosphere decrease almost twice, with the average annual rate of reduction being 6.55%. The emissions of non-methane volatile organic compounds decrease at a slower rate by an average of 2.5% per year or by 1.84 thousand tonnes on average per year. For the studied period, methane emissions decreased by 51.928 thousand tonnes, with an average yearly

decrease of 5.77 thousand tonnes. During that period, carbon monoxide emissions also decreased by 82.4 thousand tonnes, with the average annual rate of decrease being 3.3%. The values of carbon dioxide emissions are the highest, despite their significant decrease during the period – from 53,174.76 thousand tonnes in 2011 to 36,967.11 thousand tonnes in 2020, and despite the recorded decrease, they continue to be at high levels and are the main reason for Bulgaria falling into the group of countries that lag behind in the transition to a low-carbon economy. Carbon dioxide emissions decreased by 16,207.7 thousand tonnes or an average of 1,800.9 thousand tonnes per year, the rate of decrease being 3.96%. In order to achieve the goals of the European Green Pact, it is necessary to accelerate the processes of decarbonization of the economy and reduction of its carbon footprint, in an economy where the criteria for efficient and sustainable use of resources are leading. During the analyzed period, emissions of nitrous oxide and ammonia increased. Nitrous oxide emissions increased by 3.73 thousand tonnes in 2020 compared to 2011, with an annual average of 0.414 thousand tonnes and an average growth rate of 3%. Ammonia emissions increased by 4.73 thousand tons for the period 2011-2020, with an annual average of 0.53 thousand tonnes or by 1.3%. These upward trends in emissions of nitrous oxide and ammonia do not correspond to the goals set for reducing the emissions of harmful gases into the atmosphere and the transition to a green economy. Trend modelling was performed using the method of least squares, and testing the linear function, the second and third degree polynomials, as well as the logarithmic, power and exponential functions. The trend test in the time series was performed by the first-order autocorrelation coefficient r_1 at critical risk of error values of 5%: -0.564 and 0.360, and the results showed that the series contained a trend.

Emissions	r_1	Trend models	r	R^2	R^2_{adj}	P-value
Sulfur oxides	0.9742	$y = 608.01x^{-0.962}$	0.9912	0.9824	0.9802	<0.05
Nitrogen oxides	0.8776	$y = 140.6997 - 25.592\,ln(\,x\,)$	0.9593	0.9203	0.9104	<0.05
Non-methane volatile organic compounds	0.5366	$y = 85.465 - 5.497x + 1.26x^2 - 0.095x^3$	0.7520	0.5656	0.3483	>0.05
Methane	0.9578	$y = 278.08 - 1.9238x - 0.364x^2$	0.9786	0.9577	0.9456	<0.05
Carbon monoxide	0.8460	$y = 313.791 - 33.155\,ln(\,x\,)$	0.9165	0.8400	0.8200	<0.05
Carbon dioxide	0.5062	$y = 60978 - 10201.3x + 2069x^2 - 129.5x^3$	0.9356	0.8753	0.8130	<0.05
Nitrous oxide	0.9217	$y = 10.124 + 1.699x - 0.111x^2$	0.9791	0.9585	0.9466	<0.05
Ammonia	0.8581	$y = 37.042 + 1.624x - 0.109x^2$	0.9499	0.9023	0.8743	<0.05

Table 1: Characteristics of trend models
(Source: NSI and authors' own calculations)

Based on the competing models, the most appropriate trend model was made using the correlation coefficient (r), the coefficient of determination (R^2), the adjusted coefficient of determination (R^2_{adj}) and the Fisher adequacy test (F). Table 1 presents the characteristics of the selected trend models on the basis of which the changes and expected values of emissions of air pollutants into the air in the short term can be predicted. In addition to studying the dynamics, it is important to study the structure of emissions of harmful substances into the atmosphere, as it also reflects the government's policy for reducing carbon emissions. Carbon dioxide emissions have a dominant relative share – between 93% and 94.3% – in the structure of emissions of harmful substances into the atmosphere. The processes related to the burning of fuels for energy production have the largest relative share in carbon emissions, but other sources such as household combustion, waste processing and storage, transport and agriculture also contribute to the high values of carbon emissions.

In general, the Bulgarian economy is characterized by a high degree of resource intensity and energy intensity, due to the old technologies used and the delayed introduction of innovative technologies that save resources and reduce carbon emissions. Achieving these effects is possible based on the application of the circular economy principle and implementation of eco-innovation activities. During the studied period, there is a general tendency towards the reduction of emissions of air pollutants, with changes occurring in their structure, despite the constantly dominating very high share of carbon dioxide emissions. The intensity of structural changes in the emissions of air pollutants is established by means of the integral coefficient of structural changes and differences (Ks), which is known to take values between 0 and 1, and the closer the value is to zero, the weaker the occurring changes are (Yankova, 2007), (Slaveva K., 2018). The results of the analysis show that there is a process of minimal changes in the structure of emissions of harmful substances into the atmosphere compared to the base structure of 2011 – the value of the coefficient increases from 0.00401 in 2012 to 0.00913 in 2020.
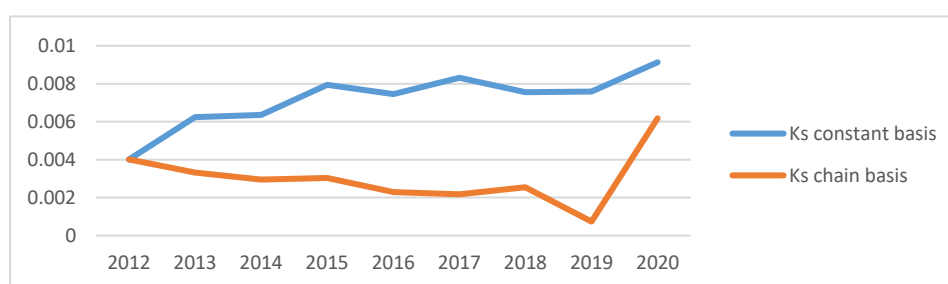

Figure 1: Dynamics of the integral coefficient of structural changes and differences
(Source: NSI and authors' own calculations)

Comparing the structure of emissions of harmful substances with the previous year as a basis, the values of the integral coefficient are lower – between 0.00074 and 0.00618 and the changes are of a much lower intensity, which increases in 2019 and 2020 as a result of the EU's policy towards a transition to a green economy, the increased requirements for countries to reduce carbon emissions, and also the changes in carbon trading policy.

3. ANALYSIS OF STRUCTURAL CHANGES IN CARBON EMISSIONS BY SOURCES OF POLLUTION

The emissions into the atmosphere are a direct result of the economic activities in the country. The amount of greenhouse gases in the atmosphere depends both on the type and amount of the raw materials used and the output produced, as well as on the level of the technologies used. Carbon emissions have the largest relative share of harmful emissions in the atmosphere (97.4% in 2020). Emission sources monitoring is carried out on an annual basis by NSI (Emisii, 2020) and includes: combustion processes for the production of thermal and electric power and heating of public buildings through the spent fuels; production processes in industry, covered through the raw materials used and the output produced; other sources, including emissions of pollutants in the air from domestic combustion; from road transport; from rail and air transport (takeoffs and landings); from waste and wastewater treatment; and from agriculture. The processes of burning fuels for energy production occupy the largest share (82% in 2020) in the structure of carbon dioxide emissions, followed by production processes (15%) and other sources – nearly 3%. The production of electric and thermal power from coal contributes to a large extent to the emitted greenhouse gases in the "Power industry" sector, where the main potential for reducing emissions is concentrated. Carbon emissions resulting from production processes in industry are the second largest source of particulate emissions and the largest source of volatile organic compounds.

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In 2020, carbon emissions resulting from combustion and production processes decreased compared to the previous year and set the lowest levels for the period 2011-2020.

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Ks	-	1,075	2,091	1,743	3,159	5,792	4,751	4,914	4,658	6,078
d	-	1,331	2,577	2,159	3,888	7,045	5,803	6,004	5,697	7,381

Table 2: Structural changes of the released carbon emissions in the atmosphere by the integral coefficient of structural changes (Ks) and the Euclidean distance (d)
(Source: NSI, Authors' own calculations)

The metrics of structural changes and differences shown in Table 2 give a general idea of the changes in the relative share of carbon emissions by pollution sources and by year for the period 2011-2020. When determining the integral coefficient of structural changes and differences, the first year of the analyzed period (2011) is taken as a basis of comparison. It is characterized by the highest level of atmospheric pollution with carbon dioxide in total and by sources, as well as per unit of GDP produced in comparable prices. The integral coefficient, calculated by year, shows a gradual moving away from the base year in structural terms – the changes and differences are both in terms of the absolute amount of carbon emissions released, and in structural terms. Similar results are obtained using the Euclidean distance metric. It is used as a basis for deepening the structural analysis by decomposing the total structural difference into factor influences (Yankova, Statistichesko izsledvane na strukturni izmeneniya, 2007).

3.1. Algorithm for determining Euclidean distance and factor influences

The Euclidean distance (d_o) is the metric that is the basis of the subsequent analysis, through its decomposition into two factor influences: measuring changes in the degree (d_3) and direction (d_4) of irregularity (Tsanova, 2010). Let the points $F_1(f_{11}; f_{21}; f_{31})$ and $F_2(f_{12}; f_{22}; f_{32})$ be two three-dimentional structures (See Figure 2), where f_{ij} are their relative shares. The distance between the two structures F_1 and F_2 is the Euclidean distance d_o. In order to determine the two factor influences (degree and direction of irregularity) it is necessary:

a) To find the distance from each of the two structures (F_1 and F_2) to the regular one $E(1/3; 1/3; 1/3)$.

b) To find the factor influence d_3, expressing a change in the degree of irregularity. On the line connecting the regular structure with the more distant of the two studied structures (F_2) let us put a point F_1', so that $|EF_1| = |EF_1'|$. The factor influence d_3 is the difference between $|EF_2|$ and $|EF_1'|$, or $d_3 = d_2 - d_1$.

c) To find the factor influence d_4 first we have to determine the coordinates of point F_1' using the following relation: $\dfrac{1/3 - f_{i1}'}{1/3 - f_{i2}} = \dfrac{d_1}{d_2}$, and this equality is used for each of the coordinates of the fictitious structure (F_1').

d) To find the factor influence d_4, expressing the change in the direction of irregularity.
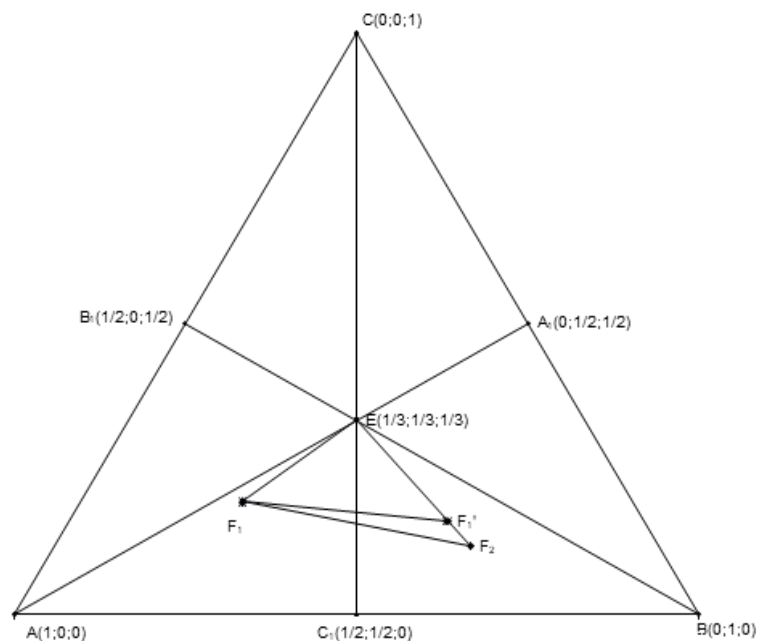
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Figure 2: Graphical presentation of total structural change and factor influences (Source: Author's own calculations)

3.2. Studying the direction of the structural dynamics of carbon emissions in the atmosphere

The analysis below is based on the changes in the relative share of carbon emissions by pollution sources for the period 2011-2020, with pollution sources being defined in the three main groups: combustion processes for the production of thermal and electric power; production processes in industry; and other sources. The distance from each structure by year for the period 2011-2020 and the regular structure is determined by applying the algorithm for calculating Euclidean distance. The closest to the regular structure determined by the d_2 distance is the structure in 2020 and it should be set as a basis. In this case, however, there will be no comparability between the integral coefficient of structural changes and differences and the Euclidean distance, and the obtained values for degree and direction of irregularity cannot be used to obtain predictive values. An argument in this direction is also that the comparisons should always be relative to a past period – usually the first one included in the analysis, which is taken as a basis. Therefore, here again the first year of the studied period (2011) is taken as a basis of comparison. There are two options when determining the factor influence. In the first one, negative values are obtained for the degree of irregularity by year, due to the fact that the basis structure (of 2011) is the furthest from the regular one compared to the others during the studied period. In this case, the graphic figure has to be shown in the second quadrant of the coordinate system. To avoid this peculiarity of the method, the values of the factor influence d_3 are determined only with a positive sign (Figure 3). The carbon emissions released during the production of thermal and electric power and heating of public buildings prevail and represent 87.42% of the total amount of carbon dioxide in the atmosphere in 2011. In the following years of the analyzed period, the released carbon emissions decrease in absolute units and in 2020 .the amount of released carbon emissions is almost twice (1.73 times) as low as in 2011. The release of carbon emissions after 2011 is also characterized by a gradual decrease in the relative share of carbon emissions released during the production of thermal and electric power and an increase in the share of those released as a result of the production processes in

the industry. In the third group – other sources of pollutants, no significant changes are observed in their relative share.
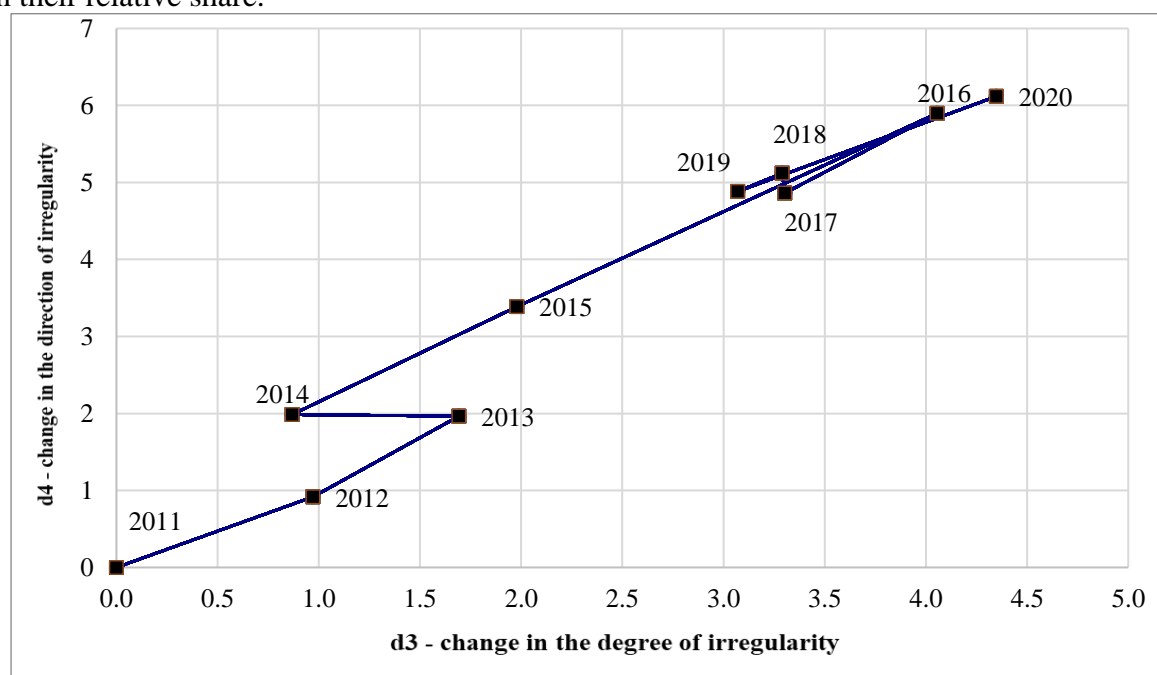

Figure 3: Structural dynamics of carbon emissions into the atmosphere by pollution sources for the period 2011-2020
(Source: Authors' own calculations)

More specifically, the structural changes in the released carbon emissions by basic groups determined by means of the Euclidean distance d_0 show a gradual distancing of the structures by individual years from the structure determined as a basis (2011). The structure of carbon dioxide emissions by pollution sources in 2016 is closest to that of 2020 (the d_0 values for the two years are 7.0454 and 7.3806, respectively). These are the two largest values of the Euclidean distance, which means that the structure of emissions by pollution sources in the two years is significantly different from the initial one.The changes in the structure of released carbon emissions for the studied period can be analyzed by assessing their strength and direction, i.e. by decomposing the Euclidean distance into factor influences (Figure 3). When analyzing the degree of irregularity, the largest values f the distance d_3 are observed in 2016 and 2020 (4.0555 and 4.3479, respectively). In the following years (2017-2019), a "return" to the initial structure is observed, determined by an increase in the relative share of carbon emissions from combustion processes and a decrease in relative units of the other two groups of carbon dioxide sources. The change towards irregularity is highly pronounced for the period up to and including 2011-2016 (for 2016, the value of d_4 is 5.8993). In the years after that, insignificant changes are observed in terms of the direction in the change of the studied structure, with the maximum value again in 2020 ($d_4 = 6.1177$). The results of applying this method show that in structural terms the relative shares by pollution sources are the closest in 2016 and 2020 with the smallest share of carbon emissions resulting from combustion processes (just over 82%). Energy production from non-renewable sources occupies the largest share in the total carbon emissions and is the main potential for reducing them.

4. ANALYSIS OF THE INTERNATIONAL AGREEMENTS FOR DISTRIBUTION OF EMISSION PERMITS
The achievement of real emission reductions is unthinkable without international collaboration and reaching international agreements. The reason is based on the nature of the problem: On

the one hand, the emissions freely cross the state borders, and on the other hand, no state has full authority over all of the emitters.

Therefore, we have to look at the process of negotiation between the different countries to jointly reduce their emissions. From a theoretical point of view, this process implies a search for a cooperative solution to a game in which the players are the countries themselves and their corresponding payoff functions are the net benefits of the abatements of countries' emissions. In the negotiation process, it is assumed that working together the countries have a strong incentive for the largest total payoff to be achieved and split afterwards. This total payoff is the sum of the payoffs in a so called full cooperative solution. In such a solution, the abatements of emissions obtained maximises the sum of the net benefits of the countries. As a starting point for the negotiations serves the Cournot-Nash equilibrium, in which each country unilaterally determines its abatement level as the best response to other countries' levels of abatement. This equilibrium is considered as a threat point for the negotiations and it consists of the payoffs the countries will receive if no agreement is reached. The problem so formulated is characterized by a wide feasible set of payoff vectors, and even if a cooperative solution is found, it is not clear how it will be reached in practice. Therefore, in the process of negotiations, some matters need to be clarified, such as the allowability of side payments between countries, instruments for reduction of emissions and obligations of the countries. Specifying these matters also specifies the class of the cooperative game and reduces the feasible set. The class of the cooperative games, in which side payments are allowed, are known as games with transferable utility (TU), and those in which it is not allowed are known as games with nontransferable utility (NTU). Popular instruments for emission reductions are, for example, mandatory abatement levels, emission taxes and internationally tradable permits for pollution. In the international agreements, the obligations of the countries are often distributed uniformly on the base of some criterion such as the base level of emissions, GDP or population. Which instrument for abatement is the best and how should be allocated the obligations to the countries? That are the questions arising in the above short review. The countries involved in the negotiations have different preferences and views on the obligations that have to be imposed on them and on other countries, and also on the instruments for the abatement. For example, it is shown in Barrett (1992) through simple examples, that if the obligations of the countries have to be distributed uniformly by the base levels of emissions, for countries with equal abatement benefits, the countries with higher abatement costs would prefer a uniform pollution taxes, while countries with lower costs would prefer uniform tradable permits. Moreover, the countries with the high costs may not sign the contract if side payments are not included. Apart from the individual preferences, there are also objective arguments for the justification of the choice of instrument based on its efficiency, accuracy and political acceptability. Recently, many experts have recommended the use of tradable permits. Barrett (1992) shows that if the obligations are uniform, the mandatory reduction may not be efficient because the result of the fully cooperative solution may not be reached. In addition, the tradable permits is an incentive-based instrument and as noted in Endres (1999), the other instruments associated with command and control regulation are not effective because regulators do not have sufficient information to differentiate charges to individual polluters. The tradable permits does not generate huge amounts of public funds that are in danger of being mismanaged, as is the case with the use of taxes. So far we have outlined some arguments in support of the choice of tradable permits as a tool for emission reduction. It remains to consider the question of how the tradable permits should be distributed among the negotiating countries. As we have mentioned earlier, a popular allocation of obligations is the uniform allocation based on the previous emission levels. As noted in Barrett (1992), this condition is not always acceptable for countries with high abatement costs if side payments are not allowed, that is under NTU cooperative game conditions. To evaluate the effectiveness of the uniform distribution of the tradable permits, we

will compare it with the case in which this condition is not imposed, using the model proposed in that paper.

Considering two countries, negotiating for abatement through tradable permits, in that paper the net benefits to the countries per unit of base level of emissions are modeled by the following functions:

$$Z_i^{TP}(\hat{q}_i, \hat{q}_j) = b_i\left(10\,Q - \tfrac{1}{4}\,Q^2\right) - \frac{c_i}{2}\,q_i^2 + c_i\,q_i\,(q_i - \hat{q}_i), \qquad (1)$$

where $\hat{q}_i$, $i = 1, 2$, are the quantities of the permits, allocated to i-th country before the trade, q_i, $i = 1, 2$, are the quantities after the end of transactions, $Q = \hat{q}_1 + \hat{q}_2 = q_1 + q_2$ is the total abatement and $c_1 q_1 = c_2 q_2$ is the equilibrium market price per unit of permit which equals to the marginal cost of abatement for the countries after the end of the transactions. The first term of (1) is the benefit to the i-th country of the total abatement, the second term is the cost for the quantity q_i of abatement and the third term is the sum of the revenues (respectively the expenditures) from the transactions of the permits for the i-th country. If the permits are distributed uniformly by the base levels of pollutions, then $\hat{q}_1$ and $\hat{q}_2$ must be equal.

It is known that if the countries come to an agreement in which the side payments are allowed (TU game), they will choose strategies which maximizes the total payoff $Z^{TP}(\hat{q}_1, \hat{q}_2) = Z_1^{TP}(\hat{q}_1, \hat{q}_2) + Z_2^{TP}(\hat{q}_1, \hat{q}_2)$. If side payments are not allowed (NTU game), $\left(Z_1^N, Z_2^N\right)$ is the unique Nash equilibrium and the set $\left\{(z_1, z_2) : z_1 > Z_1^N, z_2 > Z_2^N\right\}$ is not empty, then the solution of the game will be a point $(\bar{z}_1, \bar{z}_2)$, which maximizes the product $(z_1 - Z_1^N)(z_2 - Z_2^N)$, $z_1 \geq Z_1^N$ and $z_2 \geq Z_2^N$. Using these criteria we have found solutions of the TU game and of the NTU game with and without the condition for uniformity of the tradable permits in the private case in which $b_1 = b_2 = 1$, $c_1 = 5$ and $c_2 = 10$. In this private case, we address the first country as the low cost country and the second as the high cost country. The solutions are depicted in Figure 4. The coordinates of each point (payoff vector) are the corresponding net benefits of the two countries. The point $N(16.82, 20.6)$ is the Cournot-Nash equilibrium. The feasible set is the area shaded in grey. The point $F_{TU}(17.16, 29)$ is the full cooperative solution, which is the solution of the TU game without any additional constraints based on the choice of instrument for abatement and obligations of the countries. Since this payoff vector is a solution of the TU game, every point in the feasible set of the form $(17.16 - s, 29 + s)$ is also a full cooperative solution. This is the points of the section $X_1 X_2$ on the line ℓ_{SP}. So, the points of this section are the most effective feasible solutions.

If the countries negotiate a uniform distribution of the tradable permits and side payments are allowed (TU game), the solution is the point $U_{TP}(29, 17.6)$. As can be seen from the figure, this point is outside of the feasible set, so the high cost country will not sign the contract without a compensation clause. The same can be seen by solving the NTU game under the uniformity condition: it doesn't have a solution because the set $\left\{(z_1, z_2) : z_1 > Z_1^N, z_2 > Z_2^N\right\}$ is empty. Finally, solving the NTU game without the uniformity condition, we obtain as a solution the point $P_{NTU}(21.19, 24.97)$. As can be seen from the figure, it lies on the section $X_1 X_2$ of the most efficient admissible solutions.
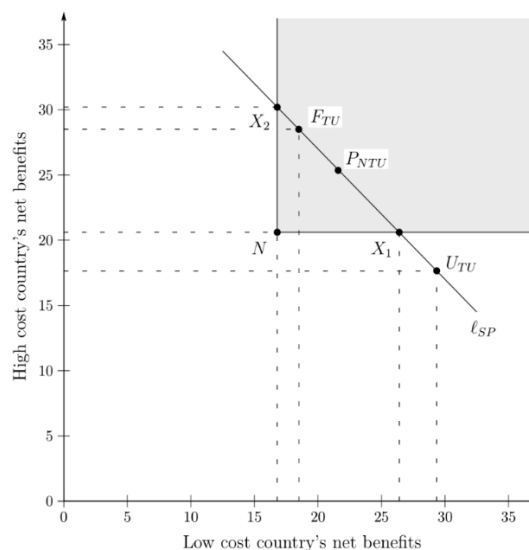
Figure 4: Game theoretic solutions for the distribution of tradable permits

5. CONCLUSION

The analysis of the dynamics and structure of the emissions of air pollutants gives a momentary assessment of the status and trends in the area of reducing the harmful emissions into the atmosphere, but based on the constructed trend models, the expected values in the short term can be predicted while maintaining the current trend of change, and also scenario analyses can be carried out regarding the expected effects when a change occurs in the rate of reduction of each individual component of the emissions of harmful substances. The results of this analysis clearly show that the goals for significantly reducing carbon emissions and the transition to a low-carbon and green economy have not been achieved and real measures are needed, including financial support from the state and incentives to reduce the carbon footprint and improve the energy efficiency of the economy and of the residential, public and business buildings, to increase the production of energy from renewable sources, etc. The emissions into the atmosphere are the result of the economic activities in the country. The amount of greenhouse gases in the atmosphere depends both on the type and amount of the raw materials used and the output produced, and on the level of the technologies used. The "Power industry" sector has the largest share in the total emissions of carbon dioxide in the country, which determines its primary importance. The production of electric and thermal power from coal contributes to a large extent to the emitted greenhouse gases in the sector, where the main potential for reducing emissions is concentrated. Energy production in Bulgaria includes various energy sources, the most important of which in terms of contribution is energy from non-renewable sources (coal and solid fuels thereof). The gradual reduction of dependence on coal, as the main source of raw materials for energy, is key to slowing down climate change. Energy-related greenhouse gas emissions can be reduced either by using cleaner energy sources (e.g. through renewable sources) or by reducing the overall energy consumption: through energy efficiency (e.g. by improving the quality characteristics of buildings, including the housing stock) and use of "greener" modes of transport or through energy savings. The transition to cleaner energy sources needs to be made very soon, not as a result of running out of fossil fuels. Given the urgency of action, the main question remains whether the state will still continue to invest in energy based on fossil fuels. In this regard, policy decisions on subsidies and tax incentives are a major tool that can influence the production of renewable energy. This also applies to investments in fossil fuels, which should be limited and, if possible, reduced to zero.

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IS BITCOIN A BLESSING OR A CURSE?

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ABSTRACT

In early 2022, the cryptocurrency market suffered a radical downward dive. According to CNBC, "the overall market capitalization of crypto assets has dropped to less than $1 trillion from its November 2021 peak of $3 trillion. It is the first time since 2021 that the asset class has been worth less than $1 trillion." Many warned that this is the moment we have been waiting for when the weaknesses of cryptocurrencies are exposed, while the intrinsic value of the cryptocurrencies remains unclear. Some investors hold the belief that the trading value of bitcoins might fall even further as "a recession and possible 'crypto winter'" is around the corner (Reinicke). Indeed, a number of currencies in the crypto market have nearly been wiped out. Stablecoins have fallen extremely precipitously, and Tether (USDT) in the Stablecoin family has lost so much value that the tokens are now valued less than the dollar (Chaturvedi). On the contrary, Bitcoin is expected to gather strength for a new round of value increases and utilization around the globe. Overall, the strength of cryptocurrency can be mainly attributed to the dependence on blockchain, the accessibility, the irreversible nature of the system, the continuously improving regulations, and the competition of currency that it induces.
Keywords: Bitcoin, Blockchain, Currency, Technology

1. THE DEPENDENCE ON BLOCKCHAIN TECHNOLOGY

Bitcoin, an invention of modern technology, is based on blockchain technology. As Marc Andreessen stated, "Bitcoin gives us, for the first time, a way for one Internet user to transfer a unique piece of digital property to another Internet user, such that the transfer is guaranteed to be safe and secure" (Böhme et al. 225). From the emergence of Bitcoin, people started inquiring about how Bitcoin works and is utilized. Blockchain, the technology that sets the foundation of Bitcoin, is a digitized, decentralized, public ledger of all cryptocurrency transactions. Blockchain creates and shares all online transactions by storing them in distributed ledgers as a data structure on a computer network. It validates transactions using a peer-to-peer network of computers and allows users to make and verify transactions immediately without a central authority (Niranjanamurthy et al. 1). Overall, a blockchain is a network that connects individuals and an immense database containing all past transactions and information modification. The entire cryptocurrency system is based on blockchain technology, and Bitcoin greatly took advantage of blockchain to generate its advantages in accessibility, anonymity, transparency and decentralization.

2. ACCESSIBLE METHOD OF CURRENCY EXCHANGE

One of the major advantages of Bitcoin is that it is easily accessible globally and thus is a highly versatile currency. It takes only minutes for a user to transfer money, and Bitcoins can also be exchanged for other currencies at any time. The accessibility of Bitcoin renders it convenient for people to exchange currencies without paying a fee ("Pros and Cons of Bitcoin"). Moreover, unlike conventional banking systems which provide users with bank accounts, Bitcoin users have their numerical codes and public keys which prevent public tracking and further confirm the anonymity of users. Protective solutions also exist for users if their information has been exposed. Users can generate a new wallet address to protect their Bitcoin account and maintain anonymity ("Pros and Cons of Bitcoin"). In modern society, people increasingly value privacy which Bitcoin facilitates.

No specific personal information is required to exchange for Bitcoins and manage transactions. Moreover, due to Bitcoin's decentralization trait, no central party such as banks exists which greatly strengthens user autonomy (Reid et al. 5). Based on the aforementioned advantages, it is evident that Bitcoin is a novel and efficient approach to transactions and has great future potential. As the world is undergoing rapid technological innovation, means of currency exchange are likewise swiftly evolving. From the historical barter trade to the emergence of currency, an important pattern emerges: currency evolution inevitably moves towards more advanced and greater scientific efficiency. Consequently, cryptocurrencies including Bitcoin are the next development after cash and will not disappear easily.

3. THE IRREVERSIBLE NATURE OF THE SYSTEM

The decentralized nature of Bitcoin, which separates itself from the central authority, lie central to this controversy of Bitcoin. Some argue that the lack of regulations and authorities implemented upon Bitcoin encourages more illegal activities, including drug, sex, arms trafficking, and illegal animal trading, while there is also insufficient protection against hackers that will occasionally steal from Bitcoin accounts. Without a central party, one has nowhere to retrace the money. However, the irreversible trait of the cryptocurrency system can also provide security for the financial system and society to some extent. The free banking system, which shares the similar ability of freely increasing currency supply with cryptocurrency, is an example. Early in the pre-Civil War era, the free banking system existed. "Anyone with sufficient funds was able to open their own bank and issue their own notes, similar to the freedom available to a programmer who adds to the supply of crypto through mining." (Tong et al.) Many economists do not approve or recognize these free banking systems, especially without government regulation, because they open up greater opportunities for fraud and suspensions of redeemability, which will result in periodic financial crisis (White). However, there were countries such as Canada, Sweden, and Scotland with free banking systems that proved the falsehood in the theory above. According to Lawrence H. White, "when free banking has existed, the interbank clearing system swiftly disciplined individual banks that issued more notes than their clients wished to hold. In other words, redeemability restrained the system as a whole." As fraudulent bankers were unable to circulate their notes, the irreversible transaction trait, existing in the Bitcoin system, actually is beneficial.

4. THE REGULATIONS ON CRYPTOCURRENCIES

Due to the significance of Bitcoin in the current financial system, most regulations attempt to sustain Bitcoin (and all cryptos) while reducing the systematic risk it poses. The fact that Bitcoin cannot be controlled by any authority is the reason that regulation is required (Prayogo 5). According to The Institute of Public Affairs, certain policies have already been implemented, including "the easing of exchange rate controls, that have enabled the freer flows of capital across political borders" (Novak). U.S Criminal Law Enforcement Network publishes an annual Bitcoin guide since early 2013 which defines Bitcoin as a currency business, not a currency. The guide places Bitcoin under the Bank Secrets Act that requires reciprocity and payment processors to fulfill certain responsibilities such as reporting, registration and record keeping (Prayogo 8-9). Ahead of the U.S., some countries have already accepted Bitcoin as a currency, though not publicly used by citizens. Japan already recognizes Bitcoin as a currency since April 2017, while Germany also considers Bitcoin legal (Prayogo 9). Japan is continuously implementing regulations on Bitcoin exchange and learning lessons from the Mt. Gox case. Mt.Gox was a cryptocurrency exchange located in Shibuya, Tokyo ("Mt.Gox"). In 2014, the exchange was hacked, and roughly 740,000 Bitcoin were stolen (Tuwiner). One key feature of the new amendment is that registration is required for the virtual currency exchange service (Ishikawa 128).

Furthermore, an amendment to the Payment Services Acts specifically defined virtual currency transactions, which sets the foundation of the regulations of Bitcoin tradings (Ishikawa 126). From Mt. Gox's case, it is clear that the cryptocurrency market is still evolving, and requires more strict regulations to ensure the security and efficiency of the system.

5. THE INITIATION OF CURRENCY COMPETITION

The rise of cryptocurrencies undoubtedly induces currency competition. Based on Daniel Snaches, "a central proposition in economics is that competition is good" (Sanches). Free markets will find the optimal way to re-organize and rearrange the demand and supply. Therefore, competition between Bitcoin – a private currency – and other currencies is inevitable. Private currencies are units of value issued by a private organization to act as an alternative to a national or fiat currency (Chen). With recent global developments, greater potential exists for private currencies. Recent investigations into private currency competition found that the money supply "will be more accurately set through decentralized provision than by a single monetary authority" (Hogan 4); "allowing multiple issuers of banknotes means that, on average, the market demand for banknotes will match the supply" (4). Thus, the presence of Bitcoins will facilitate more positive currency competition.

5.1. Concerns Regarding Volatility

Nevertheless, Bitcoin's volatility has worried the public. Bitcoin's price fell nearly 5% over the last week in the second quarter of 2022 (Gailey). Many are reacting with concern and fear. However, some analysts on Wall Street believe that this is a great chance for Bitcoin to check its system flaws and therefore exclude inadequacy and correct the imperfections. "The collapse of weaker business models such as Terra USD and Luna is likely healthy for the long-term development of this sector," said Alkesh Shah, global crypto and digital asset strategist at Bank of America (Sigalos). The price drop will bestow Bitcoin with an opportunity to rearrange itself and identify possible weaknesses to be corrected, thereby securing long-term potential in Bitcoin and other possible cryptocurrencies.

6. CONCLUSION

To conclude, Bitcoin is a blessing to the world in terms of its traits of accessibility, anonymity, transparency and decentralization in the context of the rapidly advancing world and the big data era. More importantly, its dependence on blockchain technology will further bring benefits from the application of blockchain in almost all industries, including food, manufacturing, and healthcare sectors. Bitcoin, as a cryptocurrency and thus an advanced novel technology, is still new to the world and will require improvements in the coming decades. Pinpointing its system flaws, providing improvements, and implementing regulations are crucial to more sustainable development of the system.

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EMPIRICAL ANALYSIS OF THE DETERMINANTS OF NON-LIFE INSURANCE CONSUMPTION IN BULGARIA SINCE ITS ACCESSION TO THE EUROPEAN UNION

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ABSTRACT

This study examines the determinants of non-life insurance consumption in Bulgaria after the country's accession to the EU by applying simple and multiple regression. The variables and their impact on the demand for non-life insurance are systematised in the following groups: economic, social, demographic, psychological. The results of the literature review and analysis show that economic and social factors have the most significant impact on the demand for non-life insurance. An empirical analysis based on time series (2007-2021) was performed to establish the prevalence of non-life insurance by examining the relationship between the insurance penetration ratio, the insurance density ratio, the gross written premiums of key insurance classes per capita as dependent variables and GDP per capita, average household income, savings, fixed assets (number of houses and cars), Gini coefficient, poverty line, interest rate and inflation as explanatory variables. Trend modeling was performed using the method of least squares, with linear and non-linear functions tested. Testing for trend in the time series was performed using the first-order autocorrelation coefficient at a risk of error of 5 and the Box-Pierce (BP) and Box-Ljung (BL) test characteristics. Through the Durbin-Watson coefficient (DW), tests were performed for the presence of correlation in the residual elements around the regression line. To assess the impact of the crises – the global financial and economic crisis of 2008 and the COVID-19 pandemic of 2020 – dummy variables are included in the regression models. The obtained results are in line with most empirical studies in this field.
Keywords: non-life insurance, insurance density, insurance penetration, insurance premiums, non-life insurance consumption

1. INTRODUCTION

The financial sector plays an important role in the modern economy by optimising resource allocation among economic sectors, reducing transaction costs and dealing with the problem of

asymmetric information. The financial sector is an indispensable macro risk manager, transaction environment and multi-channel for the transformation of savings into investments. As a component of the service sector, financial services are also an important part of the long-term sustainable trend of transition from an industrial economy to a service economy. The second half of the 20th century and the beginning of the 21st seem to provide plenty of evidence for the correctness of Daniel Bell, who predicted the end of the industrial age and the beginning of the post-industrial one with its two most important characteristics: a knowledge economy and dominant role of the tertiary sector in the structure of the economy, increasing role of financial and human capital, changes in employment and professions, new forms of infrastructure (Bell, 1973). The Bulgarian insurance sector started a process of integration into the European insurance immediately after the end of the state monopoly in insurance. Similar to the practice in many other socialist countries, the insurance monopoly in Bulgaria existed in a dualistic version (State Insurance Institute (DZI)+Bulstrad) from the end of the Second World War until 1989, when profound changes in the socio-political structure of the state and the transition to a market economy began. After 1990, demonopolisation and restoration of the insurance market began, with the emergence of numerous competing insurance companies. The years after Bulgaria's accession to the European Union marked the most significant increase in insurance activity after the Second World War in our country. During this period, gross written premiums in non-life insurance grew more than twice (110.5% growth for the period 2006-2021), and that in life insurance – more than three times (214.5% growth for the period 2006-2021). The indicators of the development of the insurance market in our country started from a very low base, but the insurance growth in the new millennium brought them closer to those of the countries of Central and Eastern Europe and shortened their lag compared to the insurance ratios in developed economies. The integration of the Bulgarian economy into the European economy has a long-term positive effect on economic progress and the well-being of companies and households, and hence on insurance activity. With the adoption of prudential supervision and the imposition of good corporate governance practices, a significantly higher level of financial stability has been achieved, which has a pronounced countercyclical effect. On the other hand, the Bulgarian insurance market, as a result of the integration processes, has brought market shocks from Europe and is a function of the trends in the development of the European insurance market. The paper examines in an empirical aspect the factor impact of key determinants of non-life insurance consumption in Bulgaria after the country's accession to the EU.

2. REVIEW OF THE LITERATURE SOURCES ON THE TOPIC

The demand for non-life insurance is based on models where the purchase of insurance product is seen as an exchange of a certain sum of money (premium) for an uncertain sum of money (indemnity). Thus, the demand for non-life insurance was viewed through the prism of maximising the expected utility of wealth *(Mossin J. , 1968)*, *(Borch, 1978)*. Mossin described the mechanism of risk transfer from risk-averse business entities to risk-neutral business entities, such as insurers. Insurance companies specialise in aggregating multiple risks and managing them effectively *(Mossin J. , 1968)*. The propensity to insure is closely related to the risk aversion function. Arrow pointed out that as risk aversion increases, the propensity to insure increases as a ratio of desired insurance coverage to the value of an individual's wealth *(Arrow K. , 1971)*. Szpiro noted that the Constant Relative Risk Aversion (CRRA) hypothesis was tested with general (non-life) insurance data in 15 countries over a 30-year period. This hypothesis was confirmed for 9 of the countries and was rejected for the remaining 6 *(Szpiro, 1985, p. 20)*. Pratt and Arrow illustrated how values of the risk aversion function reflect behaviour towards small risks *(Pratt, 1964)*, *(Arrow K. , 1965)*.

Arrow developed the hypothesis of risk aversion as a decreasing function of wealth and used this hypothesis in analysing the portfolio selection problem, assuming that the investment in a risky asset increases with the size of the portfolio. Mossin showed how the same hypothesis can be used to derive the implications of taxation for risk taking *(Mossin J. , 1968a)*. In a large part of the scientific works mentioned above, the analysis focuses on entities that are only concerned about capital uncertainty and excludes individuals who are concerned about the uncertainty of income or consumption in the near future. Falciglia offered an alternative model oriented towards the consumption of insurance services, emphasising the link between the money market and optimal insurance coverage. This model was based on maximising the expected utility of consumption in a two-period framework, with decisions on the choice of insurance coverage and consumption costs being made simultaneously *(Falciglia, 1980)*. At the same time, Briys and Schlesinger pointed out the tendency towards *self-insurance* or *loss-reduction* and *self-protection* or *loss prevention* as alternative methods for limiting the financial amount of damages for risk-averse business entities. This study concludes that *self-insurance* unequivocally reduces risk, while *self-protection* does not. Thus, an increase in risk aversion always increases the level of *self-insurance*, but sometimes leads to a decrease in the level of *self-protection*. S*elf-insurance*, according to Ehrlich and Becker, is always a substitute for classical insurance (when an insurance company indemnifies the loss), while *self-protection* and classical insurance can be complementary approaches *(Ehrlich & Becker, 1972)*. Lee, Hsu, & Lee examined the stationarity hypothesis of non-life insurance consumption for 31 countries during the period 1979–2005. Using the augmented Dickey-Fuller test, they concluded that non-life insurance consumption is stationary or independent of different regions and their levels of development. The empirical results show that non-life insurance consumption in these countries is a mixture of stationary and non-stationary processes. Higher risk aversion, lower income level and lower level of insurance market development may lead to non-stationarity *(Lee, Hsu, & Lee, 2010)*. The existence of a link between the development of the insurance sector and economic development is less frequently investigated. Adams et al analysed the interrelationships of the banking sector, insurance and economic growth in Sweden during a 170-year period (Adams, 2005). Ward and Zurbruegg found that in some OECD advanced market economies, insurance is a factor in economic growth, while in others the inverse relationship is valid. These dependencies are country specific, and the presence of one or the other relationship depends on a number of national characteristics (Ward & Zurbruegg, 2000). A number of studies prove the positive relationship among insurance, the banking sector and the stock market (Arena, 2006), (Webb, Grace, & Skipper, 2002). More studies have focused on revealing the influence of the insurance sector as a provider of risk transfer and insurance coverage, measured by premium income. Some studies have sought to identify the determinants of non-life insurance consumption, due to its importance to the economy both quantitatively and in terms of coverage for increasing risks and uncertainties (Outreville, 1990). Outreville conducted one of the first empirical studies of the impact of economic and financial development on non-life insurance consumption with data from 55 developing countries. He found that the demand for non-life insurance is primarily determined by the economic development of the country. In a later review of research on insurance and economic growth, Outreville pointed out that countries with high GDP certainly spend more on insurance in absolute terms, and there is a positive relationship between insurance density and GDP, but in relative terms, for two countries with similar GDPs per capita, insurance may play a different role. In addition, both life and non-life insurance are affected by each country's legal and fiscal context (Outreville J, 2011). Garcia examined the impact of economic and financial development on non-life insurance for the period 1962-2003 using data about Portugal (Garcia, 2012). According to her findings, in Portugal, GDP is the only factor that explains the volume of demand for non-life insurance services.

Cavalcante et al. analysed the relationship between economic growth and financial development (FD) as determinant drivers of non-life insurance consumption in Brazil, based on quarterly data in the period 1996-2016 (Cavalcante, Sobreiro, & Kimura, 2018). Their conclusions are in line with Garcia's research, there is a positive relationship between economic and financial development on gross written premiums from non-life insurance. For every 1% increase in GDP, a 0.77% increase in premiums is expected, proving the importance of EG to the Brazilian insurance market. Prodanov and Stanimirov show a positive relationship between GDP growth and gross written premiums in Non-Life Insurance Sector in Bulgaria with high levels of correlation and determination for the period 2009-2019 (Prodanov S. S., 2020). Kjosevski and Petkovski in a study of the determinants of non-life insurance in 14 countries of Central and South-Eastern Europe, with time series from 1995 to 2010, by applying cointegration and vector error correction models, find the existence of a long-term relationship between the number of dwellings of 1000 inhabitants and the number of cars per 1000 inhabitants and the consumption of non-life insurance. However, the number of passenger cars, the quality of the rule of law and EU membership are significant predictors of non-life insurance consumption only in the short run (Kjosevski & Petkovski, 2015).

3. USED METHODOLOGY

The review of literature sources shows that there are a number of approaches to study the influence of the determinants of non-life insurance consumption. In the process of researching the determinants and factor impact of the consumption of financial services, it is possible to use a number of macroeconomic (Zahariev, et al., 2020a), fiscal (Pavlova-Banova, Mariyana, 2018), demographic, banking indicators (Zahariev, Angelov, & Zarkova, 2022) (Prodanov, Yaprakov, & Zarkova, 2022) in terms of methodology. For the purposes of the research and the experience to extract maximum analytical information on the given problem, the authors focus on the application of methods of analysing the dynamics and of studying factor influences. Tests for existence of a trend in a time series are based on the first-order autocorrelation coefficient (r_1) and Box-Pierce (BP) and Box-Ljung (BL) test characteristics (Maddala, 1992), (Saikova, Stoykova-Kanalieva,A., & Saikova, S., 2002), (Slaveva, 2018). Trend modeling is the basis of the method of least squares. Regression and correlation methods and the accompanying tests for adequacy of models and for significance of parameters and coefficients are applied. To assess the impact of the crises – the global financial and economic crisis of 2008 and the Covid-19 pandemic of 2020 – dummy variables are included in the regression models. The demand for non-life insurance is influenced by a number of factors, which can generally be divided into economic, social, demographic and psychological. The research focuses on economic and social factors, and the following indicators are selected through a preliminary analysis: GDP per capita, average household income, average deposit, number of houses, number of cars, Gini coefficient, income quintile share ratio (S80/S20), inflation, interest rate. In the course of the research, by applying regression and correlation, the strength and direction of their influence on the dependent variables "insurance penetration ratio" and "insurance density ratio" is established. They are analysed as a general indicator for Non-Life Insurance Sector and as indicators for key insurance classes for the Bulgarian insurance market – "Motor vehicle liability insurance", "Land vehicles (other than railway rolling stock)", "Property damage insurance".

4. EMPIRICAL ANALYSIS

During the period 2007-2021, the share of gross written premiums in non-life insurance in the total premium income for Bulgaria is between 80% and 87%. The gross written premiums in non-life insurance increased continuously during the period – the average annual increase was BGN 98 764 million, and the average annual increase during the period was 5.41%.

The largest relative share in the gross written premium income in non-life insurance falls on motor vehicle liability insurance – after 2017, the relative share is about 45%. This determines its importance for the formation of the Gross Written Premiums (GWP) in non-life insurance and for the demand for non-life insurance in general, due to the mandatory nature of motor third party liability insurance. Next in terms of relative share of the GWP from non-life insurance sector is land vehicles (other than railway rolling stock) insurance – with a share between 25-32% after 2012. During the COVID-19 pandemic, there has been a decrease in the share of non-compulsory insurance products, and this is a logical result – increased uncertainty about the functioning of most economic activities, a decrease in disposable income, inflation, rising unemployment, etc. From this point of view, the study of the influence of factors on the demand for non-life insurance is important for the development of the insurance sector and for increasing the demand for non-life insurance and insurance products in general. Summary indicators for characterising the insurance sector are the insurance density ratio (the ratio of GWP to the country's population) and the insurance penetration ratio (the ratio between gross written premiums and gross domestic product). The insurance density ratio of non-life insurance shows growth – in 2007, each person spent an average of BGN 166 on non-life insurance, and in 2021, an average of BGN 387.7 per capita. The rate of growth of the indicator was high during the years of stability and growth, but during the financial crisis it was negative and the indicator decreased compared to the indicator for 2008. During the global financial and economic crisis, the insurance density ratio for non-life insurance decreased from BGN 201.46 in 2008 to BGN 183.41 in 2012. Since 2013 until 2015 the insurance density ratio increased, but in 2016 and 2017 it registered a decrease. The insurance penetration ratio was at its highest value in 2008, when it reached 2.11%, but in the years of the economic crisis, it decreased to 1.62% in 2012 and still cannot reach the pre-crisis level, because the rates, at which GDP grew were higher than the rates at which gross written premiums of non-life insurance increased. The data show that in 2015, the gross written premiums from non-life insurance exceeded the indicator for 2008 by 2.65%. For the period 2009-2014, the growth rates compared to 2008 were negative, with the biggest decrease in 2012 by 12.8%, followed by 2011 – 11.11% and 2010 – by 10.3%. Compared to the gross written premiums of the previous year, negative growth rates were registered for the period 2009-2012, with the decrease for 2009 being 4.93%, for 2010 – by 5.63%, for 2011– by 0.92% and for 2012 – by 1.91 %. During the COVID-19 pandemic, the insurance density ratio registered a minimal increase compared to 2019 (1.57%), but already in 2021 it recorded a growth of 9.5%. This clearly shows that the experience gained from the management of the pandemic in 2020 and the reduction of restrictive measures in 2021 have led to a greater increase in the funds that each person allocates to non-life insurance. In general, the process of economic recovery from the pandemic will be long and will require numerous measures to support economic sectors, households and especially persons belonging to vulnerable groups. The decline in GDP, rising inflation, disrupted supply chains, economic instability, as well as a number of geopolitical problems and conflicts, are among the factors that will determine the recovery of economies and economic development during the coming years. The descriptive analysis of time series shows that for the studied period there is an increasing trend in the indicators of gross written premiums in general and by the studied classes of insurance, GDP per capita, the number of dwellings, the number of registered motor vehicles, the average amount of deposits, the average household monetary income, the Gini coefficient, the ratio of the average income of the 20% richest to the 20% poorest (S80/S20). The trend in the change of the interest rate and the consumer price index is decreasing. The results of the tests carried out for the presence of a trend in time series are presented in Table 1. The theoretical values of the autocorrelation coefficient at the 0.05 significance level are within the limits of -0.462 to 0.328, from the values of which it follows that the time series contain a trend.

Indicators	r_1	BP	BL
insurance penetration ratio	0.9667	14.4004	17.0213
insurance density ratio	0.7811	11.7152	11.1103
GDP per capita	0.9826	14.7386	17.5849
average household income	0.9903	14.8551	17.8641
average deposit	0.9991	14.9871	18.1830
number of houses	0.9607	14.1065	16.8111
number of cars	0.9294	13.9413	15.7339
Gini coefficient	0.8669	13.0037	13.6886
income quintile share ratio (S80/S20)	0.8532	12.7977	13.2585
inflation	0.5598	8.3975	5.7085
interest rate	0.6522	9.7468	7.7468

Table 1: Tests for presence of a trend
(Source: NSI, FSC, BNB, Ministry of Interior (MoI) and author's calculations)

The results of the simple regression and single correlation show the presence of a strong influence on insurance density ratio and insurance penetration ratio of the factors GDP per capita, average household income, average deposit, Gini coefficient and income quintile share ratio (S80/S20) – single correlation coefficients are between 0.75 and 0.9. The influence of the number of dwellings (houses) and the number of motor vehicles (cars) is significant – the single correlation coefficients for all studied dependencies are between 0.55 and 0.7. The influence of inflation and interest rate is much less pronounced – single correlation coefficients are between 0.3 and 0.5. On this basis, multiple regression models are generated, including all the indicated factors and the studied dependent variables, the characteristics of which are presented in Tables 2 and 3. The presented models for the influence of the factors on the insurance density ratios for non-life insurance and for motor vehicle liability insurance and land vehicles (other than railway rolling stock)" are adequate. Multiple correlation coefficients above 0.9 are obtained for them, and coefficients of determination indicate that more than 95% of the variation in the dependent variable is explained by the variation in the factor variables included in the model. Only for the indicator based on property damage insurance, the model is not adequate and this is due to a number of psychological factors that are not included in the model, but are important when taking out this type of insurance, and for all insurances that do not have a mandatory nature and are not related to motor vehicles. On the basis of the calculated single and partial correlation coefficients, a stepwise regression is performed, by means of which the number of factors that have a statistically significant influence on the dependent variables is reduced to six. The inflation, the interest rate, and the ratio of the average income of the 20% richest to the 20% poorest (S80/S20) are omitted from the multiple regression model. The resulting models with a reduced number of factor variables have improved characteristics for the significance of the regression coefficients, while at the same time the change in the values of the correlation and determination coefficients are minimal. Testing for correlation in the residuals around the regression line by the Durbin-Watson (DW) coefficient, the empirical values of which fall within the region of uncertainty and there is no reason to claim that autocorrelation is present or absent in the residual component. For this reason, an additional calculation of the first-order autocorrelation coefficients for all adequate regression models is required, and based on them, it is established that there is no autocorrelation in the residual elements.

Table following on the next page

Factors and characteristics of models	Multiple Regression Models							
	Insurance density ratio							
	Non-Life Insurance		Motor vehicle liability insurance		Land vehicles (other than railway rolling stock)		Property damage insurance	
Intercept	1250.50	1481.57	126.52	144.317	870.754	951.426	10.685	-258.23
GDP per capita .	0.0336	0.0297	0.016653	0.01677	0.00864	0.00906	-0.0112	-0.0005
average household income	0.0103	0.0138	0.00606	0.00722	0.00198	0.00169	0.00448	-0.0027
average deposit	-0.0173	-0.0151	-0.01167	-0.01121	-0.0051	-0.0057	0.00664	0.00015
number of houses	-0.0004	-0.0004	-0.00001	-0.00005	-0.00025	-0.0003	-0.00003	0.00006
number of cars	-0.0085	-0.0100	-0.01035	-0.01131	0.01081	0.00566	0.01069	-0.0038
Gini coefficient	0.0953	-0.5262	2.0012	-1.95969	0.50257	1.62627	4.5159	2.13408
income quintile share ratio (S80/S20)	-5.8312		-9.18947		-0.01298		-3.20763	
inflation	-1.8489		-0.51828		0.40085		4.74089	
interest rate	5.2929		-1.07556		1.46844		-10.129	
Multiple R	0.9946	0.9941	0.9883	0.9876	0.98053	0.97334	0.7058	0.47401
R Square	0.9893	0.9881	0.97674	0.97531	0.96144	0.94738	0.4982	0.22469
Adjusted R Square	0.9700	0.9793	0.93488	0.95679	0.892028	0.90792	-0.40512	-0.3568
Standard Error	12.439	10.3366	10.5412	8.5865	5.0099	4.62658	7.178	7.0535
Observations	15	15	15	15	15	15	15	15
F	51.218	111.132	23.333	52.671	13.852	24.007	0.552	0.386
Significance F	0.0002	0.0000	0.0015	0.000005	0.00493	0.00011	0.7937	08685
Critical Values for the correlation coefficient	0.946	0,8540	0.946	0.8540	0.946	0.8540	0.946	0.8540

Table 2: Characteristics of the multiple regression models of the dependence between the insurance density ratio by non-life insurance and by insurance classes and the studied factors (Source: NSI, FSC, BNB, MoI and author's calculations)

Similar are the conclusions obtained in the analysis of the influence of the studied factors on the insurance penetration ratio (Table 3). The multiple regression models characterising the influence of the 9 studied factors on the insurance penetration rate for general insurance and for the motor vehicle liability insurance and land vehicles (other than railway rolling stock) insurance are adequate. Again, in order to improve the characteristics of the models and the significance of the regression coefficients, the factors with the lowest single and partial correlation coefficients are reduced. The resulting models with six factor variables have multiple correlation coefficients of 0.93786, 0.93615 and 0.97250, respectively. Again for the property damage insurance indicator, the obtained models are not adequate and the special thing about them is that with the reduction of the number of factors included in the model, the characteristics of the models do not improve, which means that they are influenced by factors that are not covered. Thus, it is once again proven that, in addition to economic and social factors, psychological factors, level of insurance culture, traditions in concluding such insurances, etc., have a significant influence on the demand for insurances that are not mandatory and are not related to motor vehicles.

Factors and characteristics of models	Multiple Regression Models							
	Insurance penetration ratio							
	Non-life Insurance		Motor vehicle liability insurance		Land vehicles (other than railway rolling stock)		Property damage insurance	
Intercept	12.7742	14.551	1.3488	0.5127	8.9762	10.282	0.41951	-1.4007
GDP per capita .	0.00009	0.000078	0.00004	0.00007	0.00004	0.00002	0.00008	-7.1E-06
average household income	0.00009	0.00011	0.00006	0.00005	0.00001	0.00002	0.00003	-2.1E-05
average deposit	-0.00014	-0.00013	-0.00009	-0.0001	-0.00004	-0.00004	0.00005	5.1E-06
number of houses	-3.1E-06	-4.0E-06	-7.5E-08	-1.1E-06	-2.4E-06	-2.8E-06	-2.6E-07	4,5E-06
number cars	0.000021	-0.00003	0.00002	-0.00002	0.00005	0.00002	0.00005	-0.00004
Gini coefficient	0.01755	0.00824	0.013375	-0.01456	0.008909	0.01854	0.02691	0.01353
income quintile share ratio (S80/S20)	-0.06215		-0.05304		-0.00946		-0.0139	
inflation	-0.00785		0.010124		-0.00366		0.03078	
interest rate	0,03241		-0.03672		0.029545		-0.066	
Multiple R	0.9461	0.93786	0.94602	0.93615	0.982665	0.97250	0.75461	0.56444
R Square	0.8951	0.87957	0.894954	0.87637	0.965631	0.94576	0.56943	0.31859
Adjusted R Square	0.7062	0.78925	0.705872	0.78365	0.903766	0.90508	-0.2056	-0.1925
Standard Error	0.0872	0.07383	0.071238	0.06101	0.045787	0.04547	0.04542	0.04517
Observations	15	15	15	15	15	15	15	15
F	4.7397	9.7383	4.73314	9.45176	15.60875	23.248	0.7347	0.62339
Significance F	0.0507	0.0026	0.05083	0.00285	0.00374	0.00012	0.6765	0.70916
Critical Values for the correlation coefficient	0.946	0.8540	0.946	0.8540	0.946	0.8540	0.946	0.8540

Table 3: Characteristics of the multiple regression models of the dependence between the insurance penetration ratio by non-life insurance and by insurance classes and the studied factors
(Source: NSI, FSC, BNB, MoI and author's calculations)

To assess the impact of the crises – the global financial and economic crisis and the COVID - 19 pandemic, on the size of the gross written premiums in non-life insurance and in the considered classes of insurance, regression models are constructed with additional dummy variables introduced into them. After their testing and evaluation, a strongly expressed negative impact of the economic and financial crisis on the insurance density ratio and insurance penetration ratio is found. The impact of the COVID-19 pandemic on them is much less pronounced, but this is also due to the fact that data for 2020 and 2021 are included, and the likelihood that the effects will occur in the next few years is significant and is caused both by the manner and scale of the impact and by the long-term nature of the transformations it has caused.

5. CONCLUSION
As a result of the empirical analysis, it is found that a highly pronounced and statistically significant influence on the insurance density ratio and insurance penetration ratio for non-life insurance and for the motor vehicle liability insurance and land vehicles (other than railway rolling stock) insurance have the following economic and social factors – GDP per capita, average household income, average deposit, number of houses, number of motor vehicles and the Gini coefficient.

The influence of inflation, interest rate and the ratio of the average income of the 20% richest to the 20% poorest (S80/S20) is much less pronounced, which is confirmed by the high values of the coefficients of correlation and determination for the multiple models in which they are not included. For the indicators based on the property damage insurance, in addition to the economic and social factors, there are also other factors that are not included in the model, mainly psychological factors, which are not the subject of the present study, but provoke our interest and may also to be analysed. The results obtained from the empirical analysis confirm the conclusions of the studies, but also reveal specific features for the demand for insurance products that are not mandatory and are not related to motor vehicles. The impact of the crises – the global financial and economic crisis and the COVID-19 pandemic manifests in different ways and durations. At this stage, the effects of the two crises are incomparable, due to the reasons for their occurrence and the unknown development of the pandemic, which cannot yet be considered over, and the assessment of its impact will change in the coming years.

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HUMAN CAPITAL MANAGEMENT IN TURBULENT ENVIRONMENT – CHALLENGES AND BEST PRACTICES

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ABSTRACT

COVID-19 poses major challenges for managers and HR professionals, but it also opens the door to opportunities that are worth knowing and understanding and that can help organizations guide their future actions. In fact, the crisis can create unexpected opportunities for organizations. COVID-19 has challenged the creativity and innovation of organizations and spurred many discussions about the future of work. Organizations should rethink their human resource management strategies and position modern information technology as a key partner for survival and ensuring the sustainability of their business. In this context, most countries are adapting their labor laws to support organizations in this sudden and unexpected transformation.The current paper is highlighting the main challenges and threads and trying to give best pracitces and ideas in order to overcome the obstacles in human resources management.
Keywords: human capital, pandemic, crisis, management, motivation

1. INTRODUCTION

Contemprary organizations must cope within rapid changing and dynamic environment during the past three years. Together with all economic pressure, HRM is still responsible for observing processes, people, and organizational efficiencies. In those uncertain times, people become the critical resource in overcoming the unexpected environmental challenges (Raychel, Mayrhofer, 2009). COVID-19 has shaken all organizations to their foundations, creating a complex and challenging environment for managers and human resource management professionals who have had to identify innovative solutions to ensure the continuity of their companies and help their employees cope with this change. COVID-19 is an unprecedented health crisis that has severely shaken the entire world, plunging it into fear and uncertainty. The pandemic is severely affecting economies, societies, employees and organizations. This crisis first began in the city of Wuhan (China), where an outbreak of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was discovered in December 2019 and spread rapidly, developing into a global pandemic (WEF, 2020). Given the rapid spread of the COVID-19 virus, many countries are implementing measures designed to reduce its spread, such as social distancing for example. Lockdown measures were imposed - people were quarantined; schools, universities, non-essential businesses and non-governmental organizations are temporarily closed (Gourinchas, P, 2020).; travel was limited; flights were cancelled; and mass public gatherings as well as social events are prohibited (Brodeur, A., Gray, D. M., Islam, A., & Bhuiyan, S, 2020). Coupled with these measures, the COVID-19 outbreak has caused a significant slowdown in global economic activities, prompting furloughs and layoffs that have led to a rise in the unemployment rate in many countries. Current unemployment in the G7 varies widely, from 30 million in the United States to 1.76 million in Japan (Kretchmer, H., 2020). According to Gourinchas, COVID-19 has generated a situation where, for a short period, 50 percent or more of the workforce may be unable to work. Trying to recover from this economic shock, companies have started to reopen in the middle of this ongoing pandemic (Major, L. E., & Machin, S, 2020)., under emergency rules and new functioning - for example, physical distancing in the workplace. This pandemic is creating a complex and challenging environment for managers and HR professionals (Shaw, W. S., Main, C. J., Findley, P. A., Collie, A.,

Kristman, V. L., & Gross, D. P, 2020). In this context, there are still few studies on the impact of COVID-19 on HRM and its challenges and potential opportunities. Leaders and HRM practitioners need the right information to help them navigate this crisis effectively so they can support their employees and keep their company's business afloat. Organizations are usually not sufficiently prepared to deal with crises when they arise (Wang, J., Hutchins, H. M., & Garavan, T. N, 2009). The main objective of the follow-up analysis is to examine the impact of COVID-19 on contemporary organizations and leadership, identifying key challenges and opportunities and providing guidance and best practices for managing organizational change.

2. CHALLENGES AND THREADS

Human resource management is concerned with how we manage recruitment and development processes in organizations (Armstrong, M., & Taylor, S, 2020). This function of management has been greatly impacted by COVID-19, generating significant challenges for managers and HR professionals. We relate this impact and these challenges to strategic human resource management such as performance management, learning and development, compensation management, safety and health management, and employee relations. Strategic HRM refers to the vertical relationship between HRM functions and organizational strategy, as well as the horizontal alignment between the various sub-functions of HRM (Wright, P. M., & McMahan, G. C, 1992). Its main goal is to effectively use the available resources to serve the strategic needs of the organization (Chapman, E. F., Sisk, F. A., Schatten, J., & Miles, E. W, 2018). In order to ensure the achievement of organizational goals in times of crisis, strategic flexibility is necessary (Liu, Y., Lee, J. M., & Lee, C, 2020).. In this context, the complexity and complexity of the COVID-19 crisis presents a significant challenge that can compromise the achievement of organizational goals. According to Baert, Lippens, Moens, Sterkens and Weytjens (2020), standard economic models in organizations are designed to analyze data that provide information about periods unrelated to surprising events or natural disasters. Therefore, it is challenging to make predictions related to "abnormal times". This suggests that making predictions related to the company's business, for example the preparation and allocation of resources, can be a very complex task. COVID-19 creates uncertainty and anxiety, even an inability to cope with the consequences of the crisis (Regmi, K., & Lwin, C. M, 2020). Some authors go so far as to predict an endemic of COVID-19, while other economists predict that the results of this pandemic will remain beyond 2021 (Akkermans, J., Richardson, J., & Kraimer, M, 2020). In such a turbulent economic period, strategic planning and management is a challenge for managers and HRM professionals. At such stages of development, most organizations are unable to provide their employees with sufficient information about their management plan or expected responses to the pandemic, although they are well aware that having clear guidelines in the workplace helps reduce stress levels. , increases the motivation and confidence of all team members. Elsafty and Ragheb's study (Wong, E., Ho, K., Wong, S., Cheung, A., & Yeoh, E, 2020) showed that access to information and communication of pandemic-related changes were associated with employee retention. Although challenging, enhancing organizational resilience is critical to ensuring organizational resilience in the era of COVID-19. In fact, despite the uncertainty caused by this pandemic, organizations must develop innovative and non-standard practices that can help cope with the crisis and effectively manage the coming changes on a global scale. Undoubtedly, the covid crisis has directly affected the social climate and working conditions in organizations. Working conditions are "the core of paid work and employment relations". They cover a wide range of topics and issues, from working hours (working hours, rest periods and work schedules) to pay, the physical conditions and mental demands that exist in the workplace. The COVID-19 pandemic has drastically changed working conditions in organizations. In fact, to ensure business continuity, most organizations are switching to remote work, requiring their employees to work from home.

For example, Google announced that the company's employees will continue to work remotely at least until the summer of 2021, while Twitter employees are given the option to work remotely indefinitely (Leonardi, P. M, 2020). Nevertheless, the category of employees who work from home represents a small part of the total workforce, because telecommuting is not suitable for manufacturing industries and cannot be applied to all job positions. In this context, there are two possible scenarios for companies whose nature of activity does not allow them to adhere to this type of working conditions. Either require their employees to be physically present, observing physical distancing measures and wear personal protective equipment, or release them (Blustein, D. L., Duffy, R., Ferreira, J. A., Cohen-Scali, V., Cinamon, R. G., & Allan, B. A, 2020). Employees whose work tasks cannot be performed from home are more likely to lose their jobs. Under these circumstances, HR professionals must identify the job positions that can be performed remotely, those that can be performed in the physical workplace, and those positions that need to be cut due to the situation provoked by the pandemic. These unexpected and drastic organizational changes pose significant challenges for managers and HRM professionals. In addition, they can have long-term effects on employees' mental health, teamwork (Hamouche, S, 2020), as well as employees' attitudes toward the workplace and interactions with their colleagues and managers.

3. PRACTICES AND POSSIBILITIES IN THE WORK ENVIRONMENT

Telecommuting and working from home presents managers and HR professionals with major challenges. First and foremost, the organization must ensure that employees working from home have the necessary tools to perform their daily tasks. Remote work requires the availability of technological products that will facilitate communication between employees and managers, such as different types of meeting software and project and task management tools (Aitken-Fox, E., Coffey, J., Dayaram, K., Fitzgerald, S., Gupta, C., McKenna, S., & Wei Tian, A, 2020). Not all organizations can afford such an expense. It is no less important to guarantee employees working from home effective communication, support, performance management, as well as adapting their remuneration to the new conditions of the labor market. Additionally, HR professionals should implement policies and support the organization in managing remote teams (Caligiuri, P., De Cieri, H., Minbaeva, D., Verbeke, A., & Zimmermann, A, 2020). HRM professionals should consider the fact that remote work can lead to employee isolation due to lack of interaction between employees, lack of communication and opportunity for teamwork, which can be a source of stress that can undermine mental employee health. Equally important is the psychological strain on these employees, given the inability to concentrate in a home environment and the multiple roles they have to take on while working from home. Many modern companies develop and implement various measures to improve the quality of the organizational climate, such as creating activities for virtual socialization, virtual lunch or coffee breaks (Maurer, R., 2020). These practices are aimed at promoting communication and help support employees during social isolation while they are away from each other and from their workplace (Carnevale, J. B., & Hatak, I, 2020). However, they also represent a great challenge for organizations, given that they are implemented in the context of unexpected changes, but these practices are new and for employees and managers who have not been previously trained or psychologically prepared for such changes. This new environment may lead to an increase in their perceptions of a discrepancy between expectations and reality and dissatisfaction if they prefer the face-to-face interaction they had before the start of the pandemic. Virtual interactions can affect the socialization process, as well as reduce the opportunity for new employees to identify with the organizational culture and contribute to its development. Recruitment refers to "the process of attracting, identifying, and retaining competent individuals to achieve organizational goals" (Giupponi, G., & Landais, C, 2020).

It has been greatly affected by COVID-19, which is completely changing its dynamics in organizations. COVID-19 has mostly had an asymmetric impact on industries. In this context, organizations that are facing financial difficulties have accepted that they are not competitive enough in the labor market to reduce their costs and try to maintain their business. from them (Campello, M., Kankanhalli, G., & Muthukrishnan, P, 2020). Millions of people find themselves unemployed during the COVID-19 pandemic. Simon points out that hiring activities have increased since companies reopened in some US states. Downsizing is not an easy decision for organizations, but it may be inevitable in times of crisis and a global pandemic. The main challenge for HRM teams in this case is to support managers and employees during this process and to propose appropriate coping strategies (Bartik, A. W., Cullen, Z. B., Glaeser, E. L., Luca, M., & Stanton, C. T, 2020). A huge number of organizations are also faced with the uncertainty of the future and the possible long-term consequences of the pandemic. Organizations expanding their businesses during the pandemic face other staffing challenges. Many have opted for more flexible employment and subcontracting, such as part-time work and project-based employees. Organizations that have increased staffing find themselves facing labor shortages. How do we carry out the recruitment process when we are not allowed to meet face to face due to physical distancing measures? Under these circumstances, organizations have no choice but to shift their practices towards virtual recruitment and selection methods, which can pose another significant challenge for HR teams (Carnevale, J. B., & Hatak, I, 2020). Technology is challenging the skills of employees, and retraining is required to cope with new technology and software. The HRM teams as well as the management of the organizations were not prepared for this unexpected change. On the other hand, virtual selection methods can affect the ability of potential employees and employers to assess the fit between a prospective employee and organizational environment, which can have a negative impact on employee productivity and retention. The temporary nature of flexible working relationships posed a challenge to employee retention. According to some authors, employee retention may represent another major challenge for organizations in the current context of this pandemic (Elsafty, A. S., & Ragheb, M, 2020).. During these difficult times of drastic and sudden change, employment relationships can be damaged, leading to a possible dramatic decrease in employee morale and increased turnover. Performance management in the organization is "an ongoing process of identifying, measuring and developing the performance of individuals and work groups and aligning them with the strategic goals of the organization" (Ismail, H., & Gali, N, 2017). It is critical to ensure that employee performance is aligned with the company's strategic goals. For companies to be effective in the face of a crisis like COVID-19, employees still need to maintain their good performance, as well as be provided with access to materials for the development and self-improvement of knowledge and skills (Sembiring, M. J., Fatihudin, D., Mochklas, M., & Holisin, I, 2020).. According to some authors, most organizations have been overwhelmed by the challenges arising from COVID-19, such as measuring employee performance and paying bonuses based on performance, that they have left strategic planning behind. Indeed, measuring employee performance during this crisis can be challenging given the changing working conditions. There are many factors related to the COVID-19 outbreak that may affect employee performance. In this context, Prasad and Vaidya's study identified that workplace isolation, lack of communication, family distractions, multiple social roles and occupational stress factors (role ambiguity, role conflict, career and work environment control) that emerged due to COVID-19, mainly among employees working from home, are significant predictors of employee performance (Aguinis, H., & Burgi-Tian, J, 2020). In addition, employee performance during remote work also depends on managers' understanding of how and what it takes to manage a remote team. Some authors argue that managers may not accept telecommuting because they may feel that it negatively affects employee performance, which may lead to micromanagement.

This phenomenon can be perceived by employees as a lack of trust, which can create tension between them and their supervisor. According to Aguinis and Burgi-Tian (2020), it is critical for organizations during this health crisis to maintain and strengthen their performance management process. They need to inform their employees about the company's strategic direction, collect business data and provide them with feedback, which will help these organizations retain their key employees. Ngoc Su et al. emphasizes that frequent evaluation of employee performance encourages their development and knowledge sharing, which can help organizations be more effective. Employee training plays a key role in a time of crisis such as this pandemic (Devyania, R. D., Jewanc, S. Y., Bansal, U., & Denge, X, 2020). Long-term training and lifelong learning favors the development of the necessary skills for employees; to raise awareness of COVID-19, to reduce the risk of spreading the virus and to prevent mental health problems. This type of communication helps employees make the transition to remote work more smoothly. In fact, not all employees possess the appropriate digital skills to cope with these changes brought about by the use of different software tools. Organizations are challenged to retrain and upskill their workforce to meet the demands of the new 'remote economy' context. In this case, the main challenge for HRM practitioners is related to the development of a training program adapted to the new reality of the organization and employees, as well as to choose the right training methods. Training should be adapted and aligned with physical distancing measures, combined with the need for employees to work efficiently to maintain the company's business. This suggests that managers and human resource management professionals need to further develop traditional training methods. Devanya recommends in this case to change employee training programs in a way that ensures a long-term transition to the new work practices. The success of telecommuting also depends on managers' understanding of virtual employee control and management (Baert, S., Lippens, L., Moens, E., Sterkens, P., & Weytjens, J, 2020). In this context, HRM practitioners must play a strategic role by supporting and training these managers how to manage a virtual team to help them overcome these difficulties and cope with the challenges of remote work.

4. CONCLUSION

Employers are responsible for protecting and providing a safe working environment for their employees while they are working. They must ensure that there are no hazards in the workplace that could harm them psychologically or physically. COVID-19 has generated a new hazard in the workplace that is a significant source of stress for employees and a significant challenge for managers and HR officers. The impact on employee health varies depending on the work environment and the employee's professional role. In this context, two main challenges can be identified: how to control the spread of the virus and protect employees from infection, and how to develop employees' awareness of the importance of complying with the prevention measures applied in the workplace. The WHO has provided guidance for organizations to ensure the protection of their employees, however, controlling employee behavior can be challenging given that some people may ignore self-isolation instructions. COVID-19 is not only a risk to physical health, but it also poses a significant risk to people's mental health. A huge challenge for employees who work from home is the feeling of isolation and role incompatibility between work and personal life. Additionally, employees who are required to be physically present at the workplace may return to work for fear of contracting the virus or passing it on to their family, which may increase their stress levels as well as the risk of mental health problems. This issue is particularly key for employees who faced high psychological demands at work before the pandemic or those who have a high-risk job, e.g. healthcare workers. The main challenge for managers and HR professionals in this context is to identify risk factors and implement the right preventive measures in the workplace, including for employees working from home.

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APPLICATION OF AUDITING INFORMATION SYSTEMS IN ALBANIA

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ABSTRACT

In recent decades technology has had an important focus in the research of academics, professionals and business and professional bodies in national and international level. It has been brought under special attention the competences accountants and auditors should have in information technology. This research is motivated by the scarcity of literature in this area in Albania. This study focuses on finding which computer assisted audit tools have been mostly used by Statutory Auditors in Albania , analyzing use of computer tools and what factors may influence the adoption of specific audit support software. In this study we have chosen to use research instruments such as surveys, interviews and auditing procedure comparison. In undertaking this query we sent questionnaires to the auditors and assistant auditors at independent audit firms. Population of the study have been all the Chartered Auditors in Republic of Albania. To investigate whether or not the proposed factors influence the content of the audit process aimed at investigating associations between variables identified by questionnaires and practical audit procedures we have separately worked on statistical analysis of two questionnaires conducted in a time span of 1 year. The first questionnaire referend to recognition of ICT and Automated Audit Tools by Chartered Auditors in Albania. Second questionnaire has been compiled taking into reference all the training phase, support and software distribution that National Institute of Chartered Auditors have had in Albania. We found out that in Albania the process of digitalization has not been helpful for application of data analysis. There appears no improvement use of technology for application of data analysis. Digitalization, online and real time communication has been found applicable. Auditors used digitalization even to create drawbacks of traditional data analysis methods. Below are presented some auditing procedures being affected by usage of Audited Information Systems. Recording was automatically conducted, data storage has been safer and easier, data capture observation and error systematicity have been affected by automation. We could see that automation affected retrieval, where account become more of an analyst than a processor. National Institute of Auditors choose an auditing software such as CaseWare Idea because partly it has been a project financed by the World Bank and partly because of the benefits the program gives to its users. CaseWare Idea is a use in more than 130 places, and over 350.000 professional use it worldwide.
Keywords: *Auditing Information Systems, International Auditing Standards, Digitalization*

1. INTRODUCTION
In recent decades technology has had an important focus in the research of academics, professionals and business and professional bodies in national and international level.

IFAC, (IFAC, 2001) in its annual report in 2001 took under special attention the competence accountants and auditors should have in information technology. In early stages technology was referred to as tools that empower an individual to perform auditing tasks. (Elliot, R.K & Jacobson,P.D, 1987). (Manson,S. et al, 1998) stated in their research that technology was referred as automation. Further studies were conducted whether accountants and auditors were fully competent in using technology in auditing procedures. (Chen,K.Y., Lin,K.L., & Zhou,J., 2005) study revealed that accountants capability in performing managerial, advisory and evaluative roles of IT deployment was an issue of great concern. (McKee,T., 2000) conclude that a large of professionals indicated either no knowledge or relatively low levels of knowledge for the 25 technologies surveyed. (IFAC, 2001) stated that accounting profession performs many roles where IT is used. As a user of information systems, accountants must be able to clearly convey their needs to the IT professionals who design the system. (Humphrey,C., Moizer,P. and Turley.S., , 2007) They should actively participate in system development projects to ensure appropriate systems designs. When they are in the position as a designer of information systems accountants are responsible for the conceptual system which determines the nature of the information, its sources, its destination and the accounting rules that must be applied. Accountant serves also as a manager of information systems, he must be able to perform appropriate analyses of IT investments, understand IT related benefits and risks and simulate and manage organizational change. Finally, as auditor of information systems it encompasses the function of internal audit, external audit and other evaluative roles (Anderson-Gough F., Grey C., and Robson K., , 2012). In Albania in 1993 was established National Council of Accounting and Auditing that had been recognized as an independent professional body. There are a variety of obligation that National Council of Accounting should monitor. Such as: To create national accounting standards in full compliance with low requirements and in full coherence with International Financial Reporting Standards. To work on a unified accounting reporting system, to interpret and unify problem faced in practice and national standards, to make needs evident and to propose solutions for improving of accounting methods. National Council of Accounting has another responsibility to keep up to data the accounting profession while simultaneously taking into consideration needs and economic requirements of Albania. The quality of auditing is a variable that has been affected by input such as value-related factors, ethics and attitudes/knowledge otherwise known as input factors closely related to the personal characteristics of legal auditors ((Tanushi.E, 2019). National Accounting Council is incorporated in international accounting and auditing bodies, such as Institute of Internal Auditors, AICPA etc. These bodies regulate the internal and external audit profession have recommended the use of computer-assisted audit tools for making the audit procedures more efficient and effective. Accounting and auditing nowadays have more than a supportive role in the business, therefore the computerized tools have been used to optimize and to ensure greater compliance of their procedures, reducing audit risk, and increasing operational efficiency. (Kruja.A., Uc.M, 2021). On December 2019 The National Accounting Council presented and trained certified auditors in different auditing softwares, two of which were CaseWare XP and EPaudit. Since the last training period the whole world faced a different and difficult period with the lockdowns, pandemic insecurity and the work in distance (Xhani.A., Avram.M., Lliescu.M-A, 2020).

2. METHODS

In this study we have chosen to use research instruments such as surveys, interviews and auditing procedure comparison. In undertaking this query we sent questionnaires to the auditors and assistant auditors at independent audit firms. Population of the study have been all the Chartered Auditors in Republic of Albania. National Body of Chartered Auditors have a published database of all the members of the council.

In Albania there are 231 Chartered Auditors and 60 Auditing Companies, hereby included branches of multinational auditing bodies. Email has been sent to all the auditors that appeared on the official database of the National Body Council of Auditors. Of all of the members, we collected a core group with auditors that have the biggest influence in the market and keep an important part of auditing in the market and we conducted face to face interviews with them. To investigate whether or not the proposed factors influence the content of the audit process aimed at investigating associations between variables identified by questionnaires and practical audit procedures we have separately worked on statistical analysis of two questionnaires conducted in a time span of 1 year. The first questionnaire referend to recognition of ICT and Automated Audit Tools by Chartered Auditors in Albania. Second questionnaire has been compiled taking into reference all the training phase, support and software distribution that National Institute of Chartered Auditors have had in Albania. In December 2019 EPAudit and Caseware XP were free of charge given to 50 auditors that had resources and support has been offered to all of them and to a wider area in implementing the software, integrating them and trying to identify what are the difficulties and challenges that this process will face.

3. RESULTS
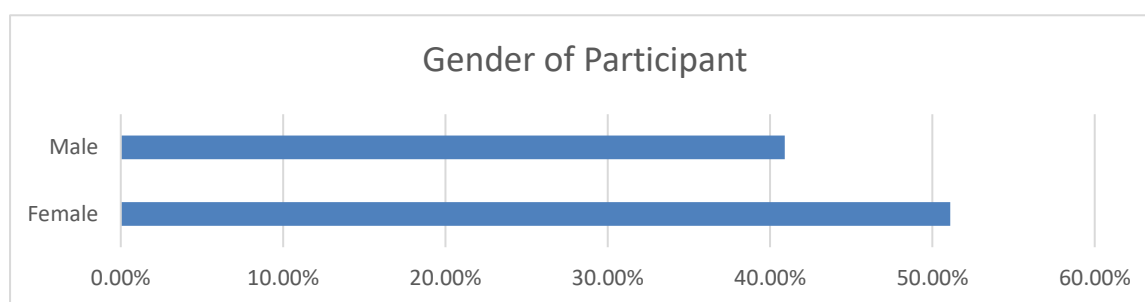
Figure 1: Gender of Participant
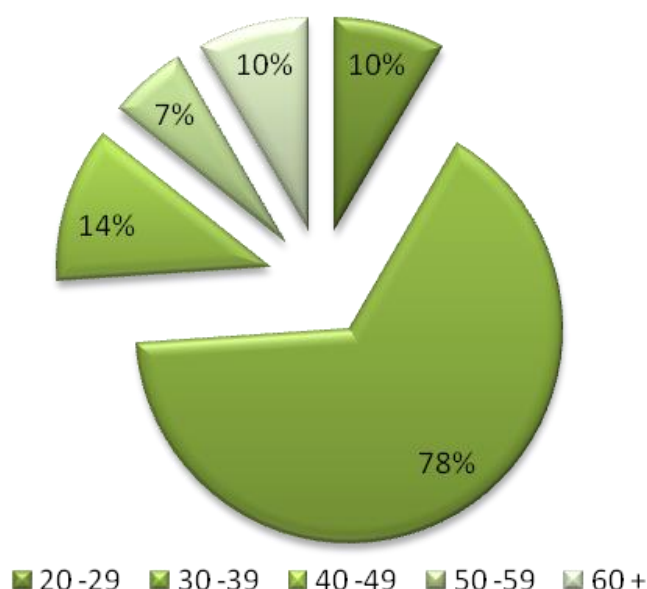
Figure 2: AGE of respondents

Age of respondents varies from 25 to 60 years old. 78 % of respondents belong to the group age of 30 -39 years old.

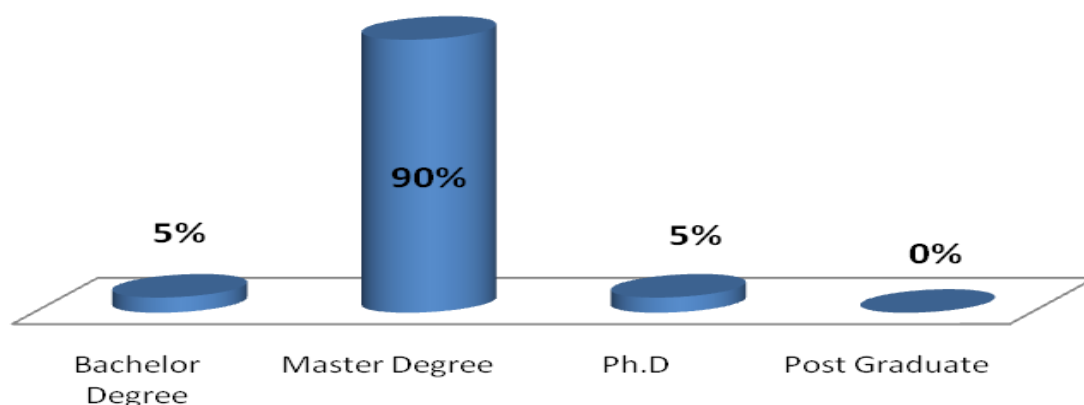| Age of respondent	20 -29	30 -39	40 -49	50 -59	60 +
	10 %	78 %	14 %	7 %	10 %

Table 1: Age of respondents

Figure 3: Qualification of respondents

As stated by the table 90 % of respondents hold a Master Degree and only 5 % a Doctoral Degree. We observe another 5 % of respondents that hold a Bachelor Degree, and we suppose that comes from respondents that do not hold a qualification on Audit as Statutory Audit.
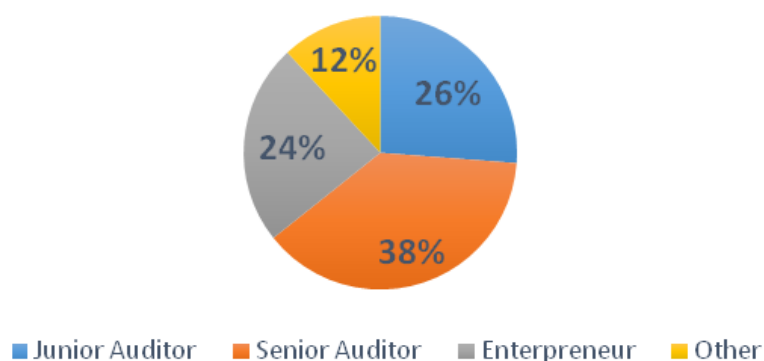

Figure 4: Position on auditing entity

	Junior Auditor	Senior Auditor	Entrepreneur	Other
Position on auditing entity	26 %	38 %	24 %	12 %

Table 2: Position on auditing entity

There appear to be 38 % of respondents as senior auditor, 26 % of them are junior auditor having an inspiring apprenticeship in becoming senior auditor 24 % of them are positioned in entrepreneurship and 12 % of our respondents come from other areas related to the field of auditing.

	0-5	6-10	11-20	21 +
Years of work experience	27 %	45 %	14 %	14 %

Table 3: Years of work experience
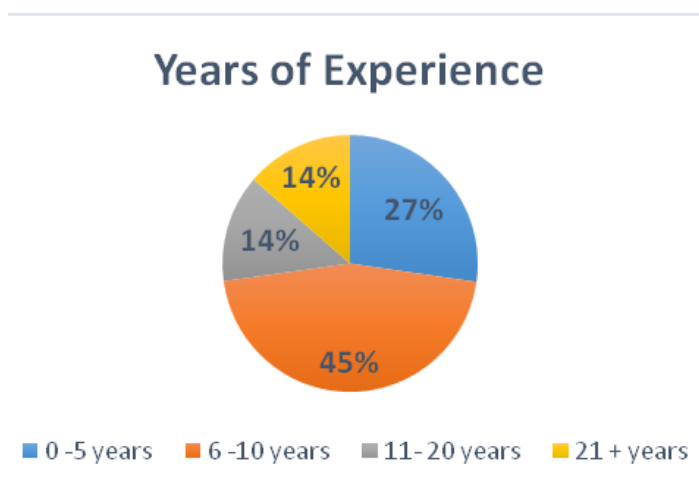
Figure 5: Years of experience

45 % of respondents had a work experience of 6- 10 years. 27 % of respondents had up to 5 years of work experience and equally were respondents who has 11- 20 and more than 21 years of work experience.
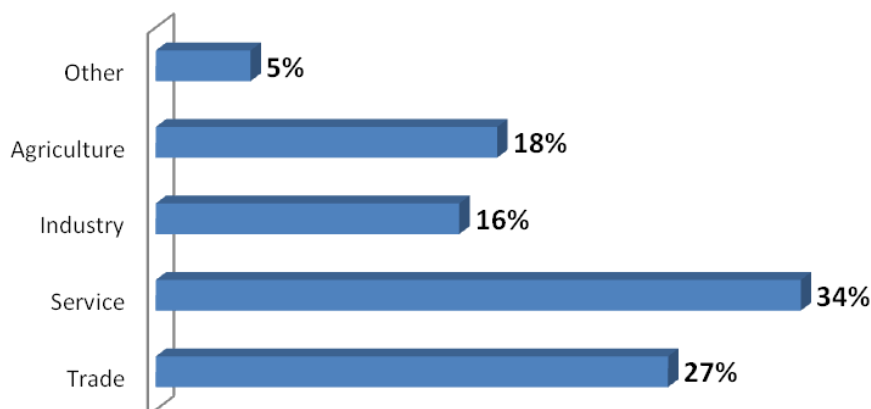

Figure 6: Type of economy mostlky audited

	Trade	Service	Industry	Agriculture	Other
Type of economy mostly audited	27 %	34 %	16 %	18 %	5 %

Table 4: Type of economy mostlky audited

Our respondents are representative mostly from industry of service where 34 % of them work on entities that audit private enterprises on service sector, 27 % of them come from trade sector and 18 % from agriculture and 16 % from industry and only 5 % come form other sectors of economy.

Size of the company currently auditing on
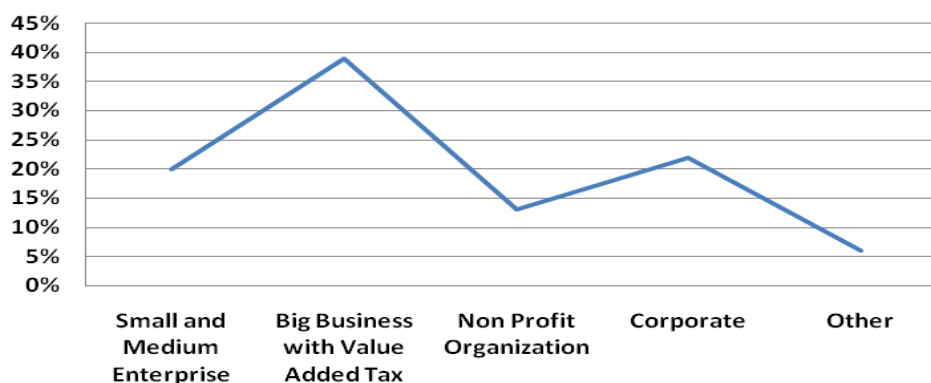
Figure 7: Size of the company currently audited on

Size of the company currently audited on	Small and Medium Enterprise	Big Business with Value Added Tax	Non Profit Organization	Corporate	Other
	20 %	39 %	13 %	22 %	6 %

Table 5: Size of the company currently audited on

39 % of audited companies are categorized as Big Business with Value Added Tax, 22 % are under the category of a corporate, 20 % are Small and Medium Enterprises and 13 % are Non profit Organizations and 6 % are from other classifications.
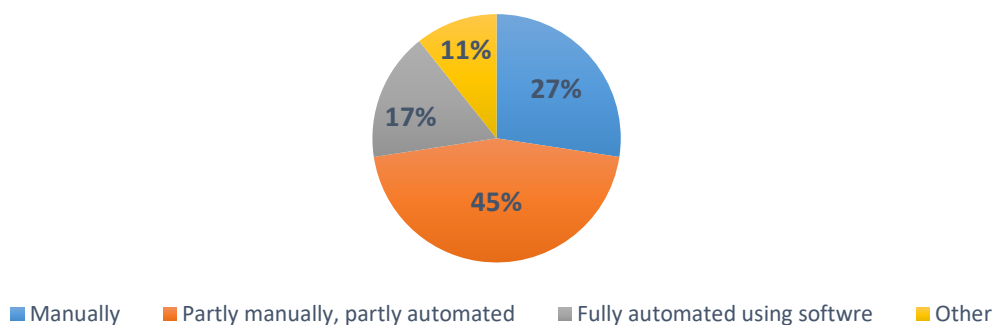
Figure 8: Previous auditing procedures

Previous auditing procedures	Manually	Partly manually, partly automated	Fully automated using software	Other
	27 %	45 %	17 %	11%

Table 6: Previous auditing procedures

There is clear evidence from the market that we have 45 % of the market using only partly software and partly worked on manually. 27 % of auditors keep on working fully manually on the process of auditing. 17 % have fully integrated software on their auditing procedures. 11 % of respondents seem to have chosen the Other alternative and refused to give an answer.

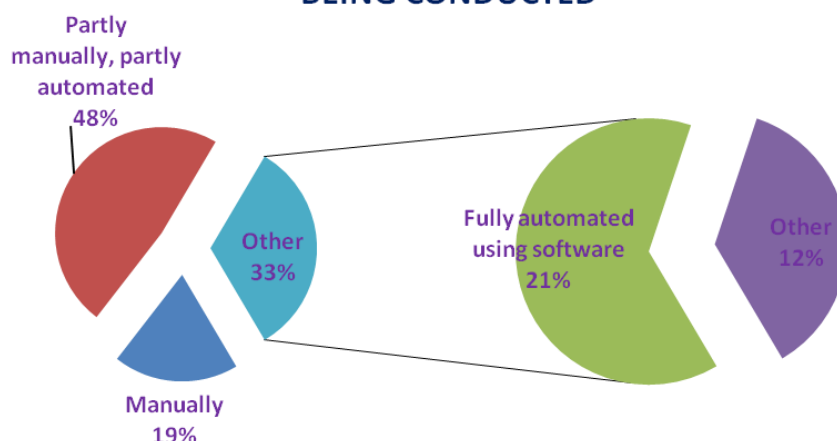## HOW IS CURRENTLY THE PROCESS OF AUDITING BEING CONDUCTED

Figure 9: Currently auditing procedures

Currently audited procedures	Manually	Partly manually, partly automated	Fully automated using software	Other
	19 %	48 %	21 %	12 %

Table 7: Currently auditing procedures

48 % of auditor in the market are still working partly manually, partly with help and use of software. 21 % are fully automated using software and 19 % of them are still working fully manually and still 12 % of them keep on not giving an answer.

Is the organization/ enterprise audited by you under any special law of income or auditing standard
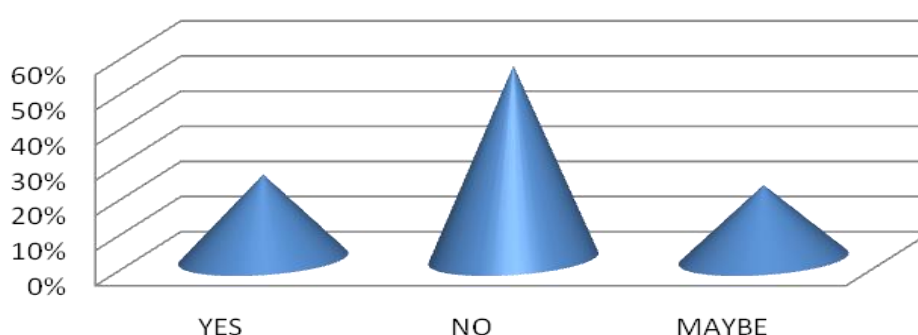
Figure 10: Is the organziation/ enterprise audited by you under any special law of income or auditing standard.

Is the organization audited by you under any special law of income or auditing standard	YES	NO	MAYBE
	24 %	55 %	21 %

Table 8: Is the organization audited by you under any special law of income or auditing standard

55 % of auditors have no entity upon which is applied any special law of income, 24 % of them are referring special auditing procedures to their entities customized by laws and 21 % have not enough knowledge to give a definitive answer on the topic.
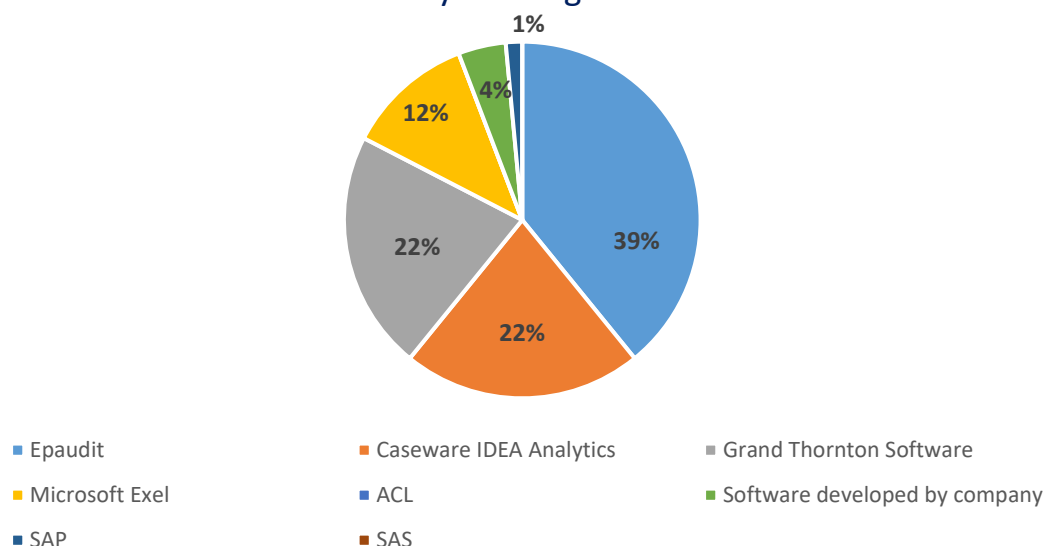

Figure 11: Auditing Software

Auditing Software	EPaudit	Microsoft Exel	SAP	Caseware IDEA Analytics	ACL	SAS	Grand Thornton Software	Software developed by company
	39 %	12 %	1 %	22 %	0 %	0%	22 %	4 %

Table 9: Auditing Software

22 % of auditors are using Caseware IDEA Analytics software, 22 % of the respondents are applicants of Grand Thornton Software, 39 % of respondents use Epaudit, 12 % of respondents use Microfostexel and 5 % use software developed by company itself.
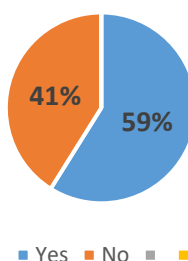

Figure 12: Is the system functioning only in premises

Is the system functioning only in premises	YES	NO
	59 %	41 %

Table 10: Is the system functioning only in premises

59 % of respondents have not the necessary facilities to provide assistance on using the software on distance. And 41 % of respondent can use the software on distance working.

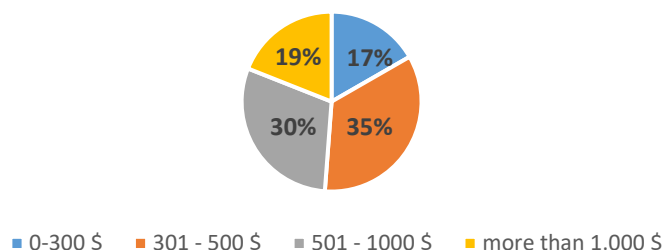## What is the cost associated with integrating a software in your auditing procedures?

- 0-300 $
- 301 - 500 $
- 501 - 1000 $
- more than 1.000 $

Figure 13: What is the cost associated with integrating a software in auditing procedures

What is the cost associated with integrating a software in auditing procedures	0 – 300	301 – 500	501- 1000	More than 1000
	17 %	34 %	30 %	19 %

Table 11: What is the cost associated with integrating a software in auditing procedures

34 % of auditors have invested among 301 -500 $, and 30 % have invested 501- 1000$, 17 % have invested less than 300 $, 19 % have invested more than 1.000 $.

Has the process of digitalization been helpfull on its offering opportunities in auditing process?
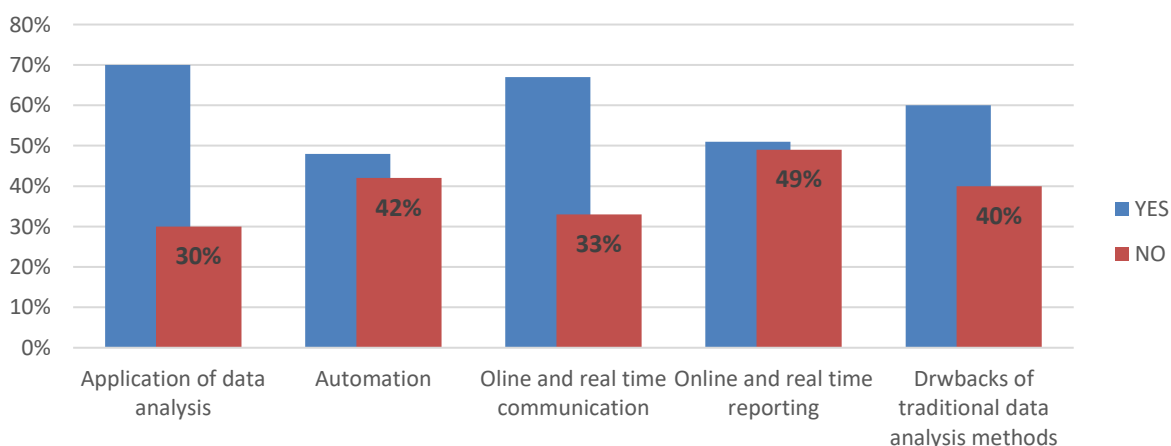

Figure14: Has the process of digitalization been helpfull on its offering opportunities in auditing process?

There have been so divergences on the answers of the respondents. The process of digitalization has been helpful only for 30 % application of data analysis. And 70 % of them have not found any improvement from use of technology for application of data analysis. Digitalization has been helpful for 42 % of the respondents on automation process. Online and real time communication has been found applicable from 67 % of respondents.

Online and real time reporting has been used by 51 % of respondents and 60 % of respondents have found useful digitalization in creating drawbacks of traditional data analysis methods.
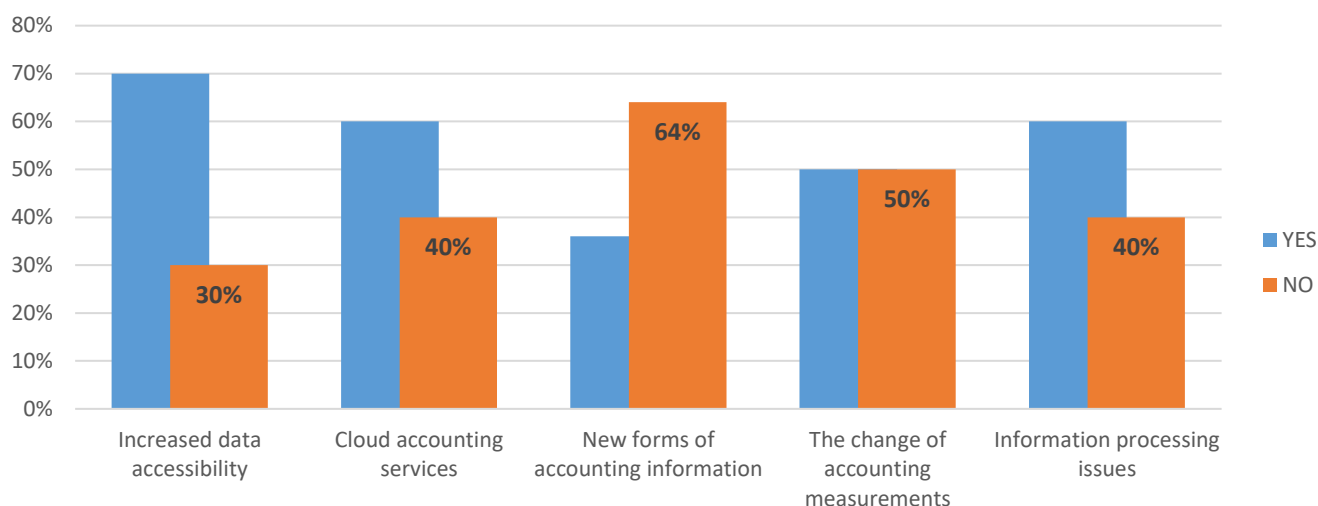

Figure 15: Has virtualization affected the following processes in auditing procedures

Virtualization has affected respondents in main auditing processes and its helpful ones. 70 % of respondents have seen increased data accessibility. 60 % of users have seen benefits from cloud accounting services, only 36 % of respondents could use new forms of accounting, for the variable of change of accounting measurements we have been fairly divided in 50 %, and 60 % of users have had benefits in information processing issues.
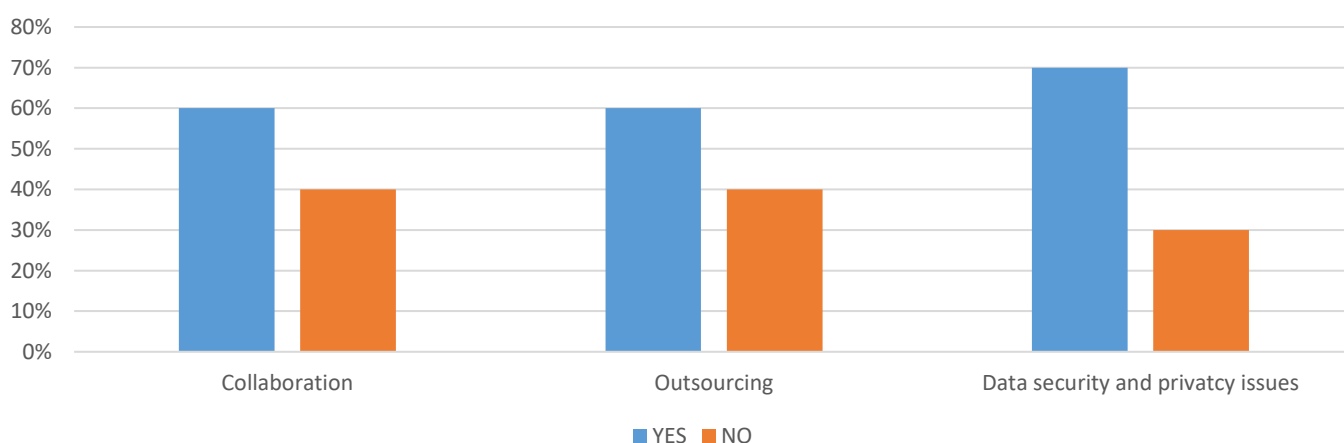

Figure 16: Has specialization affected the following processes in auditing procedures

Specialization has been correlated with three variables: Collaboration: Here 60 % of users have found better work conditions and collaboration. Outsourcing: 60 % of users have positive effect from specialization. Data security and privacy issues: 75 % of users had positive effect from specialization.

Has the usage of Auditing Information Systems used by you during auditing procedures affected the following procedures ?
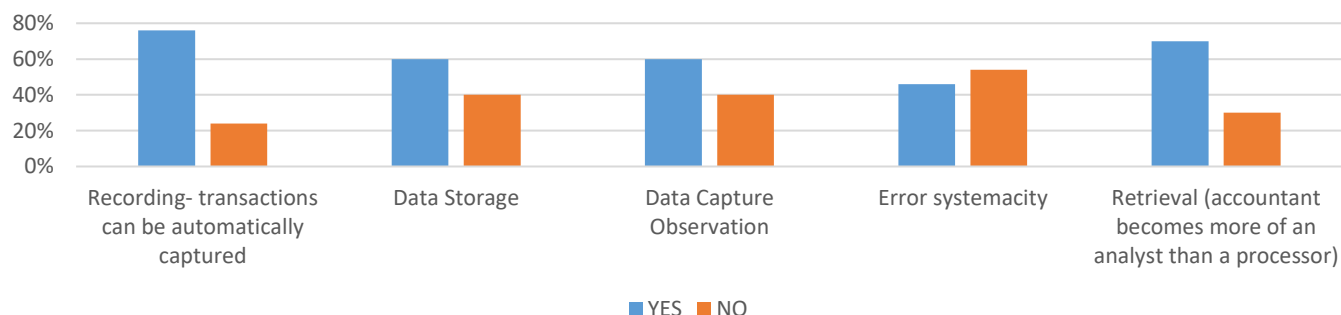

Figure 17: Has the usage of Auditing Information Systems used by you during auditing procedures affected the following procedures ?

Below are presented some auditing procedures being affected by usage of Audited Information Systems. Recording- transactions can be automatically captured: 78 % of auditor have automatically captured recording transactions. 60 % of users have seen that automation has affected the data storage process. 60 % of users have had data capture observation and 50 % of users could see that automation affected the error systemacity and 75 % could see that automation affected retrieval, where account become more of an analyst than a processor.

4. CONCLUSION

National Institute of Auditors choose an auditing software such as CaseWare Idea because partly it has been a project financed by the World Bank and partly because of the benefits the program gives to its users. CaseWare Idea is a use in more than 130 places, and over 350.000 professional use it worldwide. CaseWare WP and Audit help in conducting an auditing process through software. The software can be used to identify and document risks and answers of auditing, to automate the engagements of the client, efficient tools to revise the file, can be done at the same time in different places. There are chances of personalization, as adopting with local standards of accounting, specific industries etc. CaseWare Has Woring Papers that create a main platform. This platform helps in:

• importing the first Balance Sheet,
• create auditing lead-sheet,
• manage documents with efficiency ,
• attach all the documents of the client and additional evidence in the engagement file.
• Make visible all the findings and follow them.

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THE EFFECT OF ELECTRONIC DISCLOSURE OF FINANCIAL STATEMENTS TWHE MARKET VALUE OF THE STOCK PRICES LISTED IN AMMAN STOCK EXCHANGE (ASE)

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ABSTRACT

An electronic declaration system utilizing XBRL was implemented inside the Jordanian banking system in 2016 as part of an effort to profit from the technological movement's new electronic technologies and to improve the transparency of the financial sector. And the openness in the industry, in a manner that accomplishes fairness and assists present and future stakeholders to make their investment decisions, which would have a beneficial influence on the profitability market and all of those engaged in the industry. From this perspective, the research's major goal was to gain insight into the influence of computerized communication of monetary and nonfacts on the values of shares available for trading, on which sound investment choices are based. During the research period (2019-2021), analysts will utilize the event-based technique to look for variations and shifts in company prices as a result of information released via the computerized transparency systems and to develop hypotheses relevant to the study's goals.
Keywords: Amman, Analyzing, Event, Market Value, Mechanism, Notification System, Stockmarket

1. INTRODUCTION

With regards to sustaining and strengthening economic development, industrialization is considered to be among the most significant sectors. It became essential to concentrate on the accounting system while using their latest developments to reduce energy and effort while affecting equity markets as well as buying and selling in the banking system due to the exponential growth of this industry and the quality parameters and severity of the difficulties of the contemporary generation that cast a long shadow over all sectors, organizations, and jobs Several administrators, customers, and choice, including investors, depend on these sophisticated systems to get the correct information and make logical investment choices. However, there are many hazards associated with these sophisticated capabilities (math-Babu TS, 2020). A secure electronic accounting method was needed to ensure that stockholders in capital markets could trust the performance and consistency of annual disclosures now that they are becoming released to the public digital format. To do this, organizations needed a system that could way of measuring their trustworthiness and keep increasing business confidence while also requiring minimal routine cleanings. Technological revolutions have emerged, but little study has been done on the effect that different online radical movements, such as computerized transparency mechanisms in money markets, have had. Although academics have started to investigate the benefits of computerized transparency methods in the capital sector, there will still be a big limited literature. Summary of the most significant prior studies related to the current research effort:

- *The study (Hassan, Giorgioni, & Romilly, 2006)* The instance of Egypt's higher investment market's degree of financial transparency and the factors that influence it An investigation of the breadth and factors affecting the transparency amount of nonbusinesses listed on the Egyptian Stockmarket is conducted using panel regression findings in this research. It differs among private and public corporations in terms of their corporate features and their disclosure practices. More and more people are complying with mandated disclosures, yet there remains a low degree of information disclosure.

Organizations in the public sector tend to be less forthcoming with information than those in corporate companies. In addition, the more prosperous a company is, the more and more knowledge it is willing to share with the public.

- *The study (Almilia & Budisusetyo, 2009)* internet concerning the financial monitoring (IFSR) is examined to see whether it gives or does not disclose advice that is represented in performance, as well as if the IFR provides economic services to private that have a substantial influence on the stock value and dividend. One-hundred and seventy-nine participants were from Indonesia. This research used an autoregressive distributed lag model known as simple linear. According to the findings of this research, this is a fact. Communication theory is also congruent with the findings of this study (Bhuyan M, 2017). According to the signaling hypothesis, organizations that perform well convey signals to investors using financial information. It's possible to utilize signaling theory to forecast that high-quality corporations would use the web to broadcast "ancient" financial data. This study was aided by signaling theory.

2. RESEARCH OBJECTIVES
The objectives of the research project focus on shedding light on the impact of the level of electronic disclosure of published information on the stock prices of companies listed in the financial market at the date of their announcement, and on achieving sub-objectives, including:
1) Introducing the electronic disclosure system, in terms of the concept, the mechanism of action of the system, and its benefits
2) Highlight the most important information provided by the electronic disclosure system and how it affects stock prices
3) Building a general electronic disclosure form by analyzing the basic components
4) Analyzing the impact of the announcement of the disclosure of corporate information on the change in share prices
5) Suggest appropriate recommendations related to electronic disclosure that are commensurate with the objectives set by the Securities Commission in applying electronic disclosure in light of the results that the research project will reach.

3. LITERATURE REVIEW
In the study by (Aly, Simon, & Hussainey, 2010) Egyptian listed firms' online disclosure levels will be examined in this study to see if any possible variables might impact the amount of reporting, A research method is used to investigate how Egyptian firms' web pages utilize the material they quote. Xiao et aldisclosure .'s index is modified and used in this study. The factors of online reporting are examined using a generalized least squares regression model. More than half of Egyptian businesses report a large amount of content on their web pages, according to research (Lei M, 2015). A few financial criteria are also found to explain the wide range of online level employees across Egyptian publicly traded firms, according to the findings of this article. The volume and dissemination of information on Egyptian firms' websites are influenced by factors such as revenue, overseas registration, and industry type (telecoms and financial sectors). Online transaction reporting isn't explained by other company characteristics, such as size or indebtedness or solvency, or even the size of the auditor. A study (Sarea, Al-Sartawi, & Khalid, 2018) A comparative study of the computerized disclosure statement in Islamic banking and conventional banks in the Gulf Cooperation Council was conducted (GCC). Using a questionnaire, Islamic financing and banking operations in the Gulf Cooperation Council were compared in terms of electronic financial transparency. As of 2017, a maximum of 90 GCC banks (44 Islamic and 46 non-Islamic) were included in the study.

The total level of computerized financial statement (EFD) was found to be 73%, with Islamic institutions and commercial banks reporting EFD levels of 78% and 78%, correspondingly. As for productivity and age, the data show that there is no correlation between the two variables. In the GCC financial system, banking supervision regulators might find this research (Ayhan NK, 2021) especially useful in conceptualizing future EFD regulations and as a reference for researching EFD in the GCC financial sector. In the study (Alsartawi, 2018) An investigation of the link between internet banking declaration (OFD) and Gulf Cooperation Council (GCC) earnings growth is the goal of this study (GCC). Extensive research and checklists of 90 elements (71 content and 19 display) were devised to assess the extent of OFD by GCC bourses-listed companies in financial industry sectors. The GCC's total OFD is 77 percent, according to the data. The findings show a correlation between OFD and the success of companies. In a study (Syaeid, 2019) "The influence of the dependability of financial reporting on Electronic publication of stock markets: an experimental evidence on Jordanian manufacturing businesses quoted on the Nigerian Stock Exchange" The results of the meta assessment demonstrated a highly significant effect on the reliability of financial reporting in its measurements when the top management of budgetary functional areas related to cash issues, regulation, audit committees, and telecommunications in manufacturing enterprises quoted on the Nigerian Stock Exchange was surveyed (security, safety of operations). E-disclosures can foresee and reorganize, which improves the influence of financial reporting on the equity markets of Jordanian business owners on the Tehran Stock Exchange. Since the Financial Services Authority began using an electronically started showing signs in January 2019, this research has a distinct advantage over past studies in that it focuses on the influence of electronic notification on asset values. As a direct consequence of this, a broad sense of confidentiality framework will be constructed that encompasses the most significant confidentiality products and those that have the greatest influence on the stock buy-back modifications, as well as a period that thus directions in financial institutions' decisions due to new information about those items being made public (Adebayo TS, 2021).

4. METHODOLOGY

4.1. Research Design
This research is among the practical applications in accounting practice that deals with fixing difficulties in the workplace and generating new techniques of work and production. Using a Transference Analysis, this research describes and collects data about real-world occurrences and occurrences. There is an emphasis here on finding out exactly what you want to learn and how you may get there by presenting a series of stages or approaches.

4.2. The population of the Study
So many of the Amman Stock Currency's commercial limited by shares firms, totaling 62 at the time of the census, were included in the research (2018). Thus according to Sekaran's Tables, 87.1 percent of the community's population was represented in the selection of 54 enterprises (2000). A randomized probability sampling technique was used to guarantee that all sectors were underrepresented by the total variety of production enterprises in the overall construction sector.

4.3. Sample of the Data
At least two surveys were issued to each corporate accounting divisional filmmaker, subgroups, and audit committees government agencies. After receiving (121) surveys and analyzing 118 (90.8 percent), a maximum of (121) surveys were obtained, with (118) of the surveys distributed being examined.

4.4. Data Analysis

No.	Dimension	Alpha Value
1	Systems Security of Accounting Information	0.825
2	Confidentiality of Accounting Information	0.888
3	Privacy of Accounting Information	0.914
4	Operation Safety of Accounting Information systems	0.864
5	Readiness of accounting information systems	0.884
6	**Reliability of accounting information systems**	0.959
7	The appropriate timing	0.862
8	Predictability	0.915
9	Ability to reorganize	0.828
10	**Electronic disclosures**	**0.901**
11	**All Variables**	**0.970**

Table 1: Values of the internal consistency of the study tool sections

Because the Alpha factor for all categories varied from 0.825 to 0.959, and because all values were larger than or equal to 0.60, this implies that the study's assertions were consistent but that the authors of the study dependability and its capacity to perform scientific calculations could be relied upon.

No.	Variable	Mean	Standard deviations	Rank	Relative importance
1	Security	4.175	0.766	3	High
2	Confidentiality	4.379	0.717	1	High
3	Privacy	4.129	0.845	5	High
4	Integrity processes	4.155	0.776	4	High
5	Readiness	4.301	0.655	2	High
	Reliability of accounting information systems	4.228	0.662		High

Table 2: The mean, standard devidations, ranks and relative importance of the reliability of accounting information system

Financial statement technologies' overall dependability is shown to be strong, with a weighted mean (4.228) and a sample variance that is less than one point difference away (0.662). Consequences of a breach of privacy were followed by (privacy), which came during the last position with a median of 4.129 points and a standard error of 0.845 points, indicating high relevancy (Aktar MA, 2021).

No.	Variable	Mean	Standard deviations	Rank	Relative importance
1	The appropriate timing	3.988	0.599	1	High
2	Predictability	3.976	0.562	2	High
3	Ability to reorganize	3.675	0.636	3	High
	Electronic disclosure	3.879	0.539		High

Table 3: The mean, standard devidations, ranks and relative importance of electronic disclosure dimensions

Digital communication has a high compared relevance, with a weighted mean (3.879) and a sample variance of (3.879) inside the table above (0.539). The capacity to reorganize came out last including an average score of (3.675) and a sample variance of (0.636), but it emerged first after (right timing) with a score of (3.988) and a sample variance of (0.599).

Scale	Variable at stock price (%)
Mean	-0.698
Standard deviations	32.403
High value	187.406
Minimum value	-41.678

Table 4: Descriptive statistics of the share of the Jordanian industrial companies in the Amman stock exchange for the period 2015-2017

For Jordanian business owners in the banking industry, the actual difference in the company's stock over the year 2015-2017 were -0.698, and the confidence interval (32,403) was (187.406), whereas the federal minimum wage observation was (-0.698), as shown in the preceding table (-41.678). Jordanian manufacturing businesses have vastly differing market valuations, which may have been attributed to the varied sectors they operate in, the type and scope of a company's performance and its size as well as its repute; as well as differentiated market trends throughout the years 2015-2017. To determine whether or not the research approach is suitable for linear statistical methods and measurement test results, correlations were evaluated. Cointegration is an effect that happens when there is a flawless functional relationship among multiple variables. Because of this occurrence, the R2 shortlisting valuation is amplified and made to be greater than its real worth. As a result, the valuation of the coefficients was determined between predictor factors, following the research model. The outcomes were as summarised in the following:

Variable	Security	Confidentiality	Privacy	The integrity of processes	Readiness	appropriate timing	Predictability	Ability to reorganize
Security	1.000							
Confidentiality	0.686**	1.000						
Privacy	0.679**	0.705**	1.000					
The integrity of processes	0.702**	0.721**	0.785**	1.000				
Readiness	0.638**	0.724**	0.671**	0.752**	1.000			
appropriate timing	0.675**	0.709**	0.689**	0.749**	0.737**	1.000		
Predictability	0.598**	0.688**	0.523**	0.752**	0.547**	0.780**	1.000	
Ability to reorganize	0.725**	0.630**	0.720**	0.620**	0.509**	0.405**	0.662**	1.000

Table 5: Correlation matrix for independent variables

Table 5 reveals that the greatest Pearson correlation should be between the 2 factors (the soundness of procedures) and (private), which would have been (0.785), so less than (0.80), which implies that there is not a serial correlation occurrence among measures. If the coefficient of determination is more than 0.80, then this is taken to be an indication that the high simple correlation issue is present (Asongu S, 2016).

The dependent variable	Model Summary		Analysis of variance (ANOVA)			Coefficients				
	R Coefficient of correlation	R² coefficient of determination	F Calculated	Df Degree of freedom	SigF*	Statement	B	Std. Error	T calculated	Sig. t*
						Security	0.003	0.038	0.065	0.948
Stock						Confidentiality	0.119	0.051	2.347	0.020
Price	0.727	0.529	61.471	5	0.000	Privacy	0.144	0.039	3.666	0.000
						integrity of processes	0.041	0.053	0.779	0.437
						Readiness	0.215	0.048	4.503	0.000

Table 6: The results of the effect tes (reliability of accounting information systems) on the stock price

Coefficient (R = 0.727) indicates the link between study variables, as seen in Table 6. Using the F value of 61.471 and the significance threshold (Sig=0.000), that's less than 0.05, the influence of the predictor factors (Information systems dependability) on the explanatory variables (capitalization) is statistical significance. The fluctuation in the (company's stock) may answer for 52.9% of the variability in the regression coefficient (R2=0.529) (reliability of accounting information systems). (0.003), with such a t-value of 0.06 and a statistical significance of 0.948%, indicates that the influence of this component is negligible in the tables of correlations. We thus support the very first comment thread, which asserts that "the confidentiality of financial reporting does not have a statically meaningful influence on stock values of Jordanian manufacturing units in Main Market Of bursa Malaysia. " Transparency component B has a score of 0.119, t (2.347), and coefficient of determination (Sig = 0.020) of 0.020, showing that this dimension has an impact on results. Based on these findings, we deny the powered subwoofer stating that "there is a scientifically strong impact on the asset values of Jordanian manufacturing units on Amman Stock Exchange" Sig = 0.000 indicates that somehow this installment influence is substantial, with a B value of (0.144), T of (3.666), and a coefficient of determination of (Sig = 0.000). As a result, we deny the subs bench, which claims that "the secrecy of financial accounting has a clinically important influence on market values of Jordanian manufacturing units on Amman Stock Exchange." There used to be a result of (0.041) at the dimensions (purity of operations). The calculated t - value is (0.779) as well as the sig value of 0.437 indicates that this dimension has no influence. So we conclude that "there is no quantitatively major influence on the stock markets of Jordanian enterprises just on Amman Stock Exchange" is the fourth comment thread, which you agree For example, the B score at the preparedness dimensions (0.215), the amount of t (4.503), and the coefficient of determination (Sig =0.000) all indicate that this installment influence is statistically important (Brooks SA, 2020). Consequently, we conclude that "there is a quantitatively strong impact of financial statement preparedness on the asset values of Jordanian large businesses in Amman Stock Exchange" cannot be accepted".

5. DISCUSSIONS

In Table 1 three periods of data are shown, with incidence statistics for each time. There is indeed a steady stream of new elements in the 8-K forms since 2004, which indicates that the company's informational climate has undergone additional firm-level occurrences are now needed to be recorded in the document. As can be seen, the number of Form 8-Ks submitted between 2004 and 2006 was almost three times more than the number filed between 2000 and 2002. We can see a high degree of transparency going back to 2002 right away. A close examination of the breakup by item reveals some intriguing early findings on SOX's communication and control impacts. However, we have seen a decrease in the turnover of the firm's certified auditors and a significant rise in the leave of executive officials over time. An effective management environment may have been created through better security procedures and greater information. Tables like this one also show that investors have access to previously unavailable information. Table 3 illustrates how these Form 8-K submissions were widely publicized. The media's attention to this issue seems to be waning. While it is feasible that media's knowledge function may shrink as a result of better confidentiality environments for companies, this study suggests that communications and information environments are compatible. A similar tendency is seen at the item level, which further supports this conclusion (Chien F, 2021). The regression findings are shown in Table 4. Our findings imply that the medium had a key role in the controversy years, when the businesses had a poor knowledge environment, by reducing the impact of organization press attention compared to press-initiated exposure. However, in the pre-2002 and post-2004 periods, this gap is small.

This conclusion, together with those in Table 3, suggests that media exposure and the consulting company are substitutes. We also found that media pieces are more instructive when they are published promptly. As a result, there is good evidence that the media serves as an information middleman and replaces the company's current information infrastructure.

6. CONCLUSION AND RECOMMENDATIONS

The conclusions of this study are summarised as follows by the investigator:

1) The trustworthiness of financial reporting in Jordanian advanced manufacturing businesses in the Main Market Of Bursa Malaysia has attained a broad sense meaning of (4.228), which now has come within a week of (nondisclosure) during the first location, accompanied by (preparedness), then (protection) (The honesty of procedures), and eventually (confidentiality) with elevated perceived significance to all measurements.

2) In the Main Market Of bursa Malaysia, there is a high degree of computerized transparency in the Jordanian manufacturing units, with a memorandum of understanding of 3.879 and sample variance of 3.008. (0.539). Before (suitable time), it came second, then (narrative coherence), and third and last, (ability to reorganize) in order of priority, all of which had a high degree of significance (S-Y, 2021).

3) For example, the asset values of the Jordanian manufacturing units are dissimilar, which might also be because of the nature of projects to which they correspond, the character of their functions and processes, as well as the magnitude of the businesses, and their efficiency and renown (2015-2017).

4) Results from this study's primary value of coefficient that there is indeed a significant difference in the application of information dependability on Jordanian manufacturing company asset values in Firms Listed (security, confidentially, private, procedure consistency, and preparedness) except (security and integrity of processes).

5) This testable prediction results revealed that automated filings (adequate length of time, certainty, and reorganizability) improved the effect of financial information management on Jordanian advanced manufacturing businesses' asset values in Listed Firms concerning the four dimensions of safety (anonymity, privacy, truthfulness of procedures and preparedness) (Goodell JW, 2021).

6.1. Recommendations

1) Jordanian manufacturers need to take a more active role in developing and implementing information systems that are more focused on accuracy, appropriateness, serviceability, and timeliness.

2) That's because precise, relevant, dependable, and efficient allocation of capital information benefits both the interests of investors. They must thus be safeguarded for the sake of their long-term viability.

3) Technical education programs should be offered to personnel at all levels of a manufacturing company's hierarchy to help them better understand the relevance of accounting data systems' dependability and their role in achieving a company's goals.

4) Promoting the electronic release of information to Jordanian advanced manufacturing company executives so that they are knowledgeable and dangerous, as well as how to stay updated with the newest technological advancements, can be accomplished through the distribution of educational materials and the going to hold of practice sessions.

5) Encourage Jordanian manufacturing firms listed on the Amman Stock Markets to give investors greater electronic information by career choice, administrative, and legal requirements.

6) Verify and operating system updates accounting records safely and securely by using adequate safeguards and processes.

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IMPLEMENTING BEHAVIOURAL INTERVENTIONS TO IMPROVE LOCAL PUBLIC POLICIES: PRACTICAL INSIGHTS

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ABSTRACT
The aim of this research is to show that inexpensive and easy to implement solutions have the potential to improve local public policies. This paper presents the results of cooperation with the town of Hlohovec. The article focuses on the behavioural interventions in two specific areas identified as a problem during the meeting with town representatives – the cleanliness of public places and low citizen involvement in participatory budgeting. There are at least three main reasons why it is important to reduce littering behaviour in public places – environmental, economic and health factors. Increasing citizen involvement in the process of participatory budgeting might be beneficial because it allows people to directly decide how public money is spent. This study offers practical insights on how to find an appropriate and feasible behavioural intervention to tackle the town's issues. It also concludes that it is necessary to have support from the local officials what is crucial for the success of the implementation of any intervention.
Keywords: Behavioural intervention, Hlohovec, Participatory budgeting, Public places

1. INTRODUCTION
Local governments have been facing a number of challenges including the new one – COVID-19 pandemic. Collaboration with the town of Hlohovec started in 2019 and this paper presents the result of cooperation with it and it offers practical insights, too. There was the introductory project meeting with town representatives in autumn 2019. Multiple problems were identified by the town officials and we discussed the potential areas of possible interventions. Later, the emphasis was put only on some of the issues. This paper is focused specifically on dealing with two of those problems – the cleanliness of public places and low citizen involvement in participatory budgeting. This research aims at showing that inexpensive and easy to implement solutions have the potential to improve local public policies. Of course, COVID-19 pandemic affected our research and we had to reschedule the experiment dealing with the cleanliness of public areas because it just makes no sense to carry out interventions if the town is in lockdown and people are not allowed to move freely. The first experiment was oriented to decrease the total number of dog excrement in the city park because dog fouling is a widespread and long-term problem in several locations in the town. To the best knowledge, this is the first behavioural intervention focused on dog fouling in Slovakia and there is a need to come up with functional measures that would prevent dog fouling in Slovakia. The second experiment is not completely finished yet. However, there are preliminary results available. It is focused on increasing citizen involvement in the process of participatory budgeting. In the town of Hlohovec, the participatory budgeting mechanism is a stable part of self-governing processes and citizens can become more involved in public money spending.

2. INTERVENTIONS
2.1. Reducing the total amount of dog excrement in the city park
2.1.1. The reason for implementing the intervention
The main aim of the first meeting with town officials in autumn 2019 was to identify issues that could be addressed using behavioural interventions. One of the problems that was identified in

discussion was dog fouling in public places. Obviously, the problem is long-term and widespread, and is easily visible throughout the town, especially in the parks. Moreover, residents request to take pragmatic steps for solving this problem, and the town registers a number of complaints from them. Lowe et al. (2014) examine that it is important to solve the issue because of positive impacts on human health, public complaints, and cleaning costs. Chen et al. (2018) emphasise potential serious health consequences associated with the parasitic disease called toxocariasis and other serious diseases. Macpherson (2013) adds that in this case personal hygiene is extremely important, but it can be problematic for children. BBC (2015) finds out that between 2014 and 2015, in England and Wales municipalities received more than 70,000 official complaints from dissatisfied citizens who communicated their anger at the dog excrement they found in public areas. It seems that a number of complaints is one of the main reasons why local governments are keen to tackle the problem of dog fouling (Keep Wales Tidy, 2016a). It is estimated that English and Welsh municipalities spend approximately £22 million on a yearly basis on clean-up activities related to dog waste collection and disposal (Atenstaed and Jones, 2011).

2.1.2. The main objective of the intervention
The main objective of the intervention is to change the behaviour of dog walkers in the city park through interventions. It is expected that the number of dog faeces left in the city park will decrease by 25%. The expected reduction is based on past experiments and studies, their results and recommendations (BBC, 2012a; BBC, 2012b; BBC, 2013a; BBC, 2013b; Keep Wales Tidy, 2016a; Keep Wales Tidy, 2016b).

*2.1.3. Design and implementation of the intervention*
The selection of a suitable solution had several steps. Firstly, a database of existing interventions implemented by other researchers was created. Secondly, an overview of suitable interventions was prepared and presented to the town representatives in October 2020. The town of Hlohovec approved proposed form of the intervention and its location in the end of October 2020. Table 1 indicates four phases of the experiment between December 2020 and September 2021.

Phase	Activity	Time period
1	Experimental design: creation and fine-tuning	December 2020 – February 2021
2	Intervention implementation	June 2021 – July 2021
3	Intervention evaluation	July – August 2021
4	Presentation of results and recommendations	September 2021

Table 1: Reducing the total amount of dog excrement in the city park –
Phases of the experiment
(Source: author)

In October 2020, the timetable to carry out the intervention was approved and planned for March and April 2021. Based on the results of studies and experience from implementation (Blenderman et al., 2018; Keep Britain Tidy, 2015; Lowe et al., 2014) the initial decision was to conduct the experiment in March and April when the most suitable conditions are expected. Unfortunately, due to the COVID-19 pandemic it was rescheduled for June and July 2021. The experiment was implemented through two interventions. A pink spray for the first intervention was chosen and the yellow footprints for the second one considering the effectiveness and recommendations from above mentioned experiments and studies. Basically, the intention was clear – to find a low-cost, easy to implement, effective, and measurable solution that can be used at any place. Intervention 1 involved the application of coloured spray on dog faeces.

Based on the experiences and recommendations of different researchers (Keep Britain Tidy, 2015; BBC, 2012a; BBC, 2012b; BBC, 2013a; BBC, 2013b; Keep Wales Tidy, 2016a; Keep Wales Tidy, 2016b) the pink spray was used for its visibility. It is based on chalk and can be easily removed with water and/or rain. Intervention 1 used the salience effect to change the behaviour of dog walkers. The salience effect was highlighted by the pink colour, which creates a strong contrast with the surroundings. Therefore, the dog faeces were visible from a greater distance. In addition to the salience effect, the intervention 1 was also based on the principle of social approval. It was assumed that clear visibility of excrement will cause embarrassment, shock, or outrage in people (BBC, 2012a; BBC, 2012b; BBC, 2013a; BBC, 2013b; Keep Wales Tidy, 2016a; Keep Wales Tidy, 2016b). As a result, the people try to change either their own behaviour and/or the behaviour of others. Intervention 2 used yellow footprints. The aim was to increase dog walkers' awareness of the availability of waste bins in the city park. Similar to the intervention 1, the salience effect is present. The yellow footprints are self-adhesive, non-slip with a reflective colour, which is very important especially in poor visual conditions or during the night. The combination of two interventions can be seen in Figure 1.
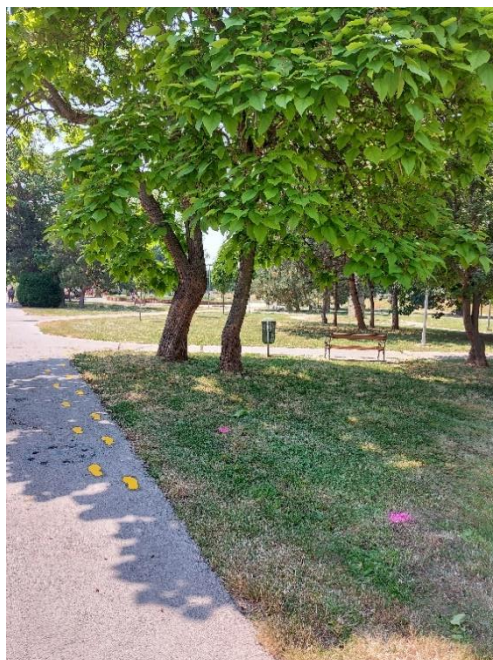
Figure 1: Highlighting dog fouling (intervention 1) and leading to desired behaviour (intervention 2)
(Source: author)

2.1.4. Intervention results and evaluation

Based on the results of past experiments, it was expected that the number of dog faeces left in the city park will decrease by 25%. The intervention 1 (spraying) reduced the number of dog excrement in the city park by 31.8%. In the next step, the yellow footprints were used in a specific location where a sharp increase in the number of dog faeces was observed during the data collection after implementing the intervention 1. The combination of two interventions (spraying and yellow footprints) led to a 40.9% reduction in dog fouling in the city park. No damage was reported to footprints. Therefore, they can be used over a longer period of time which has a positive impact on costs. The pink spray was still clearly visible after seven days and fulfilled its function. However, it must be emphasized that during the intervention implementation almost no precipitation was recorded in the area. During the rainy season it is recommended to spray more often than once per week.

2.2. Increasing citizen involvement in the process of participatory budgeting

2.2.1. The reason for implementing the intervention

In autumn 2019, the town representatives identified a problem of low citizen involvement in participatory budgeting. Basically, they saw two problems happening at the same time:
a) low number of projects submitted, and
b) low number of voters.

However, taking a look at the Table 2, there was a regular increase in the number of voters since the beginning of the participatory budgeting in the town of Hlohovec. Therefore, the emphasis was being put on different issues in the town of Hlohovec. But it changed when above mentioned problems were intensified by the COVID-19 pandemic and the numbers of both projects submitted and voters decreased, most significantly for the number of voters in the sixth year of the participatory budgeting (2021/2022) in the town of Hlohovec as shown in Table 2. That was an opportunity and right time to start thinking if it is possible to change a negative trend and increase both the number of projects submitted and voter participation.

Year	Number of projects submitted	Number of voters
First year 2016/2017	6	585
Second year 2017/2018	6	705
Third year 2018/2019	16 (6 CP + 10 HC)	not available
Fourth year 2019/2020	13 (6 CP + 7 HC)	982
Fifth year 2020/2021	14 (8 CP + 6 HC)	1398
Sixth year 2021/2022	12 (4 CP + 8 HC)	650

Table 2: Participatory budgeting in the town of Hlohovec
Note: CP – civic project; HC – projects carried out by the town of Hlohovec
(Source: author; data from https://www.hlohovec.sk/participacia.html#m_430116)

Participatory budgeting is a tool used to involve citizens in setting priorities and deciding how public money is spent. Harkins and Escobar (2015) conclude that participatory budgeting is a process that help citizens to shape local services and meet local priorities more effectively. They also developed ten strategic choices in the design of participatory budgeting and ten key principles for its effective delivery. They highlight that design is crucial, and therefore the number of both voters and projects submitted can be increased by adjusting the design.

2.2.2. The main objective of the intervention

There are two objectives:
*   The first objective of the intervention is to increase the number of projects submitted compared to the reference fifth year of the participatory budgeting (2020/2021) in the town of Hlohovec.
*   The second objective of the intervention is to increase voter participation compared to the reference fifth year of the participatory budgeting (2020/2021) in the town of Hlohovec.

The reason for choosing year 2020/2021 is simple. From the perspective of the town of Hlohovec, it was the most successful year because of the number both of projects submitted and voter participation.

2.2.3. Design and implementation of the intervention
In 2022/2023, the town of Hlohovec plans to implement activities to promote the participatory budgeting, which include:
a) personal meetings with residents to clearly communicate the process of participatory budgeting,
b) production of short videos (interviews) with citizens and civic associations whose ideas were successfully implemented in the previous period,
c) creation of a unified identity of the participatory budgeting – a logo, slogan, colour, etc.

The selection of a suitable solution had several steps. It was created a database of existing interventions implemented by other researchers. Later, an overview of suitable interventions was prepared and presented to the town representatives in January 2022. The town of Hlohovec approved proposed form of the intervention in the beginning of February 2022. Table 3 indicates four phases of the experiment between February 2022 and November 2022. The timetable to carry out the intervention depends on the process of the participatory budgeting in 2022/2023 and it is planned from April until October 2022. To the best knowledge, this is the first behavioural intervention focused on increasing citizen involvement in the process of participatory budgeting in Slovakia.

Phase	Activity	Time period
1	Experimental design: creation and fine-tuning	February – March 2022
2	Intervention implementation	April – October 2022
3	Intervention evaluation	November 2022
4	Presentation of results and recommendations	November 2022

Table 3: Increasing citizen involvement in the process of participatory budgeting –
Phases of the experiment
(Source: author)

Gerlit et al. (2017) examine reasons for low participation in Germany and identify four reasons: lack of knowledge, prerequisites are not provided, no interest, and refusal to participate. They add that surveys suggest that citizens really want to be a part of participatory budgeting process, but the reality does not match the expectations. Citizen participation is very low and some German cities have already cancelled their participatory budgeting projects. Švaljek et al. (2019) conclude that there is an extremely low level of citizen involvement in participatory budgeting process in the city of Zagreb. They add that the citizen participation is determined by demographic, household, and socio-economic characteristics. The solution might be to use measures which encourage spontaneous participation in the process of participatory budgeting. Interestingly, Harkins and Escobar (2015) highlight that it is necessary to improve citizen participation and they indicate increased participation among the most disadvantaged groups in the town. In some cities the process of participatory budgeting works well – Boston, Chicago, New York City, etc. All of these cities use some slogan – Young people are deciding how to spend one million dollars of the city's budget (Boston), Our Money, Our Vision, Our Chicago (Chicago), and Real Money, Real Power: Participatory Budgeting (New York City). After the consultations with town officials an agreement was reached.

The slogan for the seventh year of the participatory budgeting (2022/2023) in the town of Hlohovec is:

We have allocated €60,000 for your ideas.

A short and easily remembered phrase was preferred. This approach is based on knowledge from behavioural science, commonly used in cities with relatively higher citizen participation.

2.2.4. Intervention results and evaluation
As mentioned in the introduction, the second experiment is not completely finished yet. On the other side, there are available preliminary results related to the first objective of the intervention – to increase the number of projects submitted compared to the reference fifth year of the participatory budgeting (2020/2021) in the town of Hlohovec. The deadline for submitting was July 1, 2022. The total number of projects submitted is sixteen, five civic projects and eleven projects that should be carried out by the town of Hlohovec. The overall number of projects submitted equalled the most successful year so far – 2018/2019. There is a sharp increase of 33% in comparison to the previous year. Voting period is scheduled for September and October, 2022, with no fixed dates yet.
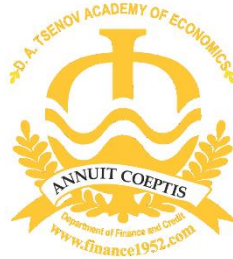
3. CONCLUSION
The paper aimed at showing that inexpensive and easy to implement solutions have the potential to improve local public policies. It is also necessary to highlight that the cooperation with the town of Hlohovec was at a high level with outstanding support from municipality officials during the entire process related to the planning, preparation, and implementation of the interventions. It might be due to the fact that problems were identified by the town representatives in the early beginning of the cooperation. Therefore, it is strongly recommended to use a similar approach which appears to be an essential prerequisite for successful collaboration in order to achieve the best possible results. Interestingly, despite the positive research results, the town of Hlohovec have no plans to implement behavioural interventions in the near future. One of the reasons is that the impact of COVID-19 pandemic has been putting pressure on the town officials and there are still many challenging and unpredictable tasks associated with it. Definitely, future research should be aimed at long-term interventions and that is one of the main limitations of this research.

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