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TABLE OF CONTENTS

~ Avant-garde management and leadership - from the company hierarchy to self leading and self organization

Change, globaliization and management

In the cause-effect relationship, change and globalization decisively influence the evolution of management. Obviously, we can also raise the issue of how management has accelerated, through repeated changes at the organizational level, the tendency of globalization. Management with its three dimensions: the existence of the market, the industrial means of organizing production and the corporation as the major form of business organization must adapt to new realities. The „three revolutions in management": the detachment of management from production, the emergence of managers, professionals in the field and attracting employees in management activities foreshadow a fourth phase that must define the evolution of management in the digital age. The „digital logic" leads to another „managerial logic" which is influenced by the speed with which decisions can be made, by generational changes, by dramatic changes in the environment and by changes in legislation. Attracting employees in activities specific to work management and in increasing production quality, forming joint boards between employees and managers, establishing a profit-sharing system and employee representation on corporate boards are signals of changes in managerial attitudes. Exceptional organizational skills, strong entrepreneurial spirit, the continuous improvement of the staff, the ability to be a finisher are defining components of the management of the future.

In perspective, management imposes „three rules of action": defining the product portfolio in relation to what is desired, bought and brings in revenue, selecting the effective means to achieve the objectives, defining strategies based on valid information and on knowledge and using only the necessary resources. Adapting to the process of globalization, exploiting any resource generated by this process, are the commands of management. Pragmatism will emphasize work behavior, increase efficiency and the use of financial resources as an incentive will become standard.

Obviously, the way of thinking and the way of acting will change dramatically with the emergence of theories based on the spectacular changes in cutting-edge technologies. The last challenge is the „metaverse" that will generate „parallel worlds".

We will live and we will see.

Prof. Ph.D. Paul Marinescu

Corporate social responsibility: A stackedholder's management approach

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Abstract: *Nowadays, organizations are required to acknowledge that their survival is no longer depending only on shareholders, but also on other stakeholders. Companies must identify all the legitimate parties of interest and manage them properly. Corporate social responsibility (CSR) has proven to be an efficient tool that can be used in this regard, aiming to balance efficiently the interest of the economic entity and its stakeholders. The paper intends to provide a comprehensive framework of how corporate social responsability can be integrated in the management principles of stakeholders. The research methodology was based on the collection and analysis of secondary data, respectively scientific articles, and relevant books for the subject. The results outline the idea that businesses can no longer function properly without considering the needs of variuos stakeholders and fuflling them in a responsible manner.*

Keywords: stakeholders, corporate social responsibility

JEL: M14, I31

1. Introduction

In the past decades, the globalization phenomenon has revealed many opportunities for business to grow. Several economic and social trends have risen as possibilities that might contribute to the survival and welfare of companies. The current business environment requires organizations to adapt rapidly to those ascending trends in order to remain competitive. Humanity, sustainable and durable development represents required factors that should be considered by economic entities giving their perceived and acknowledged impact among other parties. Giving the limited resources and boundaries, companies are not able to fulfill all expectations. In this context, the business organization's strategy and management of requirements plays an important role in its ability to perform and achieve its objectives in line with current demands.

Nowadays, organizations are required to acknowledge that their survival is no longer depending only on shareholders, but also on other stakeholders. As it is impossible to address the needs of all parties of interest, companies must identify the relevant partners and find a solution for managing them properly. Corporate social responsibility (CSR) has proven to be an efficient tool that can be used in this regard. Furthermore, it represents a multidimensional concept that encompasses a company's economic, legal, ethical, and social responsibilities and aims to balance efficiently the interest of the economic entity and its stakeholders (Toma, 2006; Toma, 2008;Toma, Stanciu and Irimia, 2011; Toma and Marinescu, 2011; Toma and Hudea, 2012). The paper intends to provide a comprehensive framework of how CSRE can be integrated in the management principles of stakeholders.

2. Literature review

Approaches regarding social responsibility

Since the mid of the last century social responsibility has become a subject of interest for many researchers as it is found in various organizations from different domains (Marinescu, Toma and Constantin, 2010; Toma, Stanciu and Irimia, 2011; O'Sullivan, Toma and Marinescu,2015; Imbrișcă and Toma, 2020; Zainea, et al, 2020). The notion of CSR can be briefly described as a series of responsibilities of an organization (Toma and Marinescu, 2013). The concept emerged due to the pressuring need of encouraging the development of a healthy and people-oriented business environment while increasing profits. Furthermore, CSR can be perceived as a process based on two questions, namely which are the responsibilities of the company and to whom the organization should be responsible to. Developing an understanding of which are these parties of interest of a company that should be addressed through a responsible orientation represents a common topic in the existing literature. A chronological synthesis of the most relevant approaches to social responsibility can be considered the following: the shareholder, the stakeholders and the societal approach (Oprea, 2011; Toma, 2013).

The shareholder approach implies that a firm should only focus on its responsibility towards shareholders and maximizing profits. Milton Friedman supported this perspective firmly stating that "the social responsibility of business is to make a profit. Other initiatives of social

responsibilities should be handled by national governments" (Benedict, 2015). Indeed, the first responsibility of a company is to be profitable, but it should not be the only objective (Voiculescu and Neagu, 2016). Nowadays, the modern and global business environment requires organization do to more and to contribute on both social and economic levels (Dumitrașcu, 2015).

Therefore, the second approach, respectively the stakeholder theory stated by Freeman has been embraced as the dominant paradigm of corporate social responsibility (Oprea, 2011). This approach suggested that an organization should consider all its partners of interest and it has been recently developed and debated in existing literature as a consequence of the pressuring social issues. Freeman defined stakeholders as "any group or individual that can affect or is affected by the achievement of an organization's objective" (Benn and Bolton, 2013, pp.196). Identifying the types of stakeholders relevant for a company represents an important step towards establishing strong relationship by fulfilling existing social needs and developing effective models of interaction with these partners (Simionescu, 2018). Stakeholders have been categorized into internal (employees, shareholders, owners/managers) and external (suppliers, customers, local communities, non-governmental organizations and associations, governments and national and international) ones (Voiculescu and Neagu, 2016). In the context of stakeholder approach, CSR has been described as an acknowledgment to internal and external stakeholders' demands (Lock and Seele, 2016). Existing studies classified CSR into internal and external activities based on the nature of an organization's stakeholders (Lokuwaduge and De Silva, 2019). Moreover, companies which integrated CSR into their business strategy seem to consolidate their relationship with its partners by minimizing conflicts that may appear and increasing loyalty among them (Lokuwaduge and De Silva, 2019). Therefore, corporate social responsibility has been perceived as an efficient way of building strong relationship with the relevant stakeholders identified of the company.

On the other hand, the societal approach highlights the fact that companies should also consider the responsibilities they have in regards with the society. The environment and the society should be perceived as stakeholders, taking into consideration their contribution to the growth of business (Benn and Bolton, 2013). The environment provides the energetic resources that are essential for producing goods, and a prosperous society means an opportune environment for economic growth. CSR represents ,,a concept of a company's responsibility to support itself through balanced relationships with the society and the environment in which it operates" (DincerandDincer, 2013, p.178).

A stakeholder approach to corporate social responsibility

Stakeholder theory provided a new framework for identifying organizational duties (Polonskyand Jevons, 2009). It shifted attention away from straight profit maximization by implying that the interests of shareholders cannot be addressed without some degree of satisfaction of the requirements of other stakeholders (Jamali, 2008). In other words, even if a company's primary goal is to serve its shareholders, it might nevertheless fail. Therefore, extending the focus of companies to a broader picture could be appreciated as a business strategy that makes sense since it allows economic entities to maximize shareholder wealth while simultaneously improving the total value generated (Sroufe, 2018).

Additionally, stakeholder theory sustains that all parties of interest are important and that businesses should take into consideration the needs and expectations of all of them (Jamali, 2008). Thus, this balancing act of interest managed by an organization has proven to be challenging to implement in practice. Rather than creating all types of social benefit for all stakeholders, companies are hampered in practice by limited resources and boundaries (Enquist, et al., 2006). Considering these barriers that economic entities face, identifying and prioritizing mutual beneficial relationships is required (Maignan, Ferrell and Ferrell, 2005). Moreover, varied interests should be comprehended. Customers, employees, suppliers, and investors, for example, may have various needs, and a fine-grained approach may be required to determine even distinctions among main stakeholder groups (Harrison and Freeman, 1999). Individual stakeholders, on the other hand, frequently have comparable expectations regarding desired company activities and impacts (Maignan, Ferrell and Ferrell, 2005).

Stakeholders are vital for organizations as they provide resources that are necessary for the long-term performance (Freeman, 1984). For instance: „stockholders can provide capital; suppliers, material resources or intangible knowledge; local communities may contribute with an infrastructure or even a location; employees and managers with expertise, leadership and commitment; customers with loyalty and positive word-of-mouth; and the media can help spread positive corporate images. Stakeholders have control over the organization because they may withdraw or threaten to remove required resources" (Ferrell, et al., 2005, pp.934). The relevance of stakeholders can be measured based the following aspects: the organizational principles and norms; the pressure of stakeholders groups and the legitimacy of the parties of interests (Mitchell, Agle and Wood, 1997).

After identifying the relevant stakeholders, companies should figure out how to manage them properly. The nine most referenced principles of stakeholder management in building stakeholder relationships have been established as the following: acknowledge, monitor, listen, communicate, adopt, recognize, work, avoid and acknowledge conflicts (Clarkson, 1999). CSR may be perceived as a suitable approach for building and managing relationship established between an organization and its parties of interest as being defined as a multidimensional construct that encompasses a company's economic, legal, ethical, and charitable responsibilities (Enquist, Johnson andSkålén, 2006). In a nutshell, "CSR refers to a company's ethical behaviour toward society. This includes management operating responsibly in its interactions with all stakeholders that have a real interest in the company, not only shareholders" (Scott, 2007). Companies engage in CSR efforts in order to build and maintain positive connections with a variety of stakeholders (OlaruandPirnea , 2012). The concept addresses several parts of interests such as: "the shareholders by being a long-term profitable approach; the employees by including flexible and fair workplace policies, opportunities for career development; the customers by taking care of the respect for consumer rights, disclosing of accurate information about products and focusing on customer satisfaction; government by paying taxes regularly and complying with legal regulations; local communities by making charitable donations; the environment by recycling initiatives and by developing more sustainable products and processes" (Chaudhary, 2017).

A CSR orientation helps organizations to inquire benefits and achieve objectives by considering the needs of relevant stakeholders. Increasing profits remains a key objective of modern organizations, but how this financial gain is obtained is equally important nowadays.

3. Research methodology

The present study represents a quantitative research involving gathering and analysis of secondary data (scientific articles and books). After setting the research objective, respectively developing an understanding of how CSR might be implemented in the management of stakeholders and how it may contribute to this regard. Based on exiting literature, the first step conducted in this research in order to achieve the stated objectives was finding relevant scientific journals for defining the concept. Well-known sources such as Emerald Insights and Science Direct were used in this scope.

The second step followed was identifying key connections between the stakeholder theory and its relevance for the CSR concept. Furthermore, a structure of the process of integrating CSR in the management of stakeholders has been provided.

The research has started with a briefly introduction of the most relevant approaches regarding social responsibility, focusing afterwards on the stakeholder's perspective and how CSR might be used for managing the relevant partners and for the company overall. Starting from Clarkson's nine principles, a two-phase process has been developed. In the first phase, organizations should make an assessment regarding its own identity and directions for growth. Understanding its current needs and objectives and critically evaluating to what extend it is a responsible company, facilitates the further analysis of stakeholders. Partners should be also evaluated based on their own performance and importance for the company. Following step is building relationships with the parties which share common values or objective and prove to be relevant for the firm. By adopting CSR practices such as opened and constant communications in order to identify possible issues from stakeholders and fulfilling moral, ethical and legal obligations, firms could establish beneficial collaborations with its partners of interest. Once build, relationships should be maintained. Recognizing and motivating stakeholders play an important part in the maintenance process, development of commitment and avoidance of conflicts or pressure from stakeholders. Overall, the second phase outlines a constant effort that should made in a responsible manner in order to be build strong collaborations that might benefit the company's performance.

4. Results and discussions

Findings show that the society's conceptions regarding the responsibilities of an organization are always changing. Moreover, the global business environment sustains a sustainable economic and social development. CSR popularity increased considerable in this context being perceived as a new way of doing business by focusing on gaining profits and considering the wellbeing of people and the planet.

This paper sustains that the stakeholder approach is quite possibly the most broadly utilized perspective for clarifying the idea of what CSR is and how this concept might be beneficial for

organizations. Furthermore, from a management point of view, a CSR approach helps companies to understand to who they should be responsible and what needs of all parties that contribute in a way or another to the survival and profitability of an economic entity should be met considering the organization's values, requirements and priorities. This outcome is in line with several existing studies such as Chaudhary (2017) and Lokuwaduge and De Silva (2019). Thus, shareholders remain a valuable component of companies, but they can no longer be seen as a stand-alone priority giving the concerns of other parts of interest and the pressure and influence, they have in the current business environment. Moreover, starting from Clarkson's principles regarding stakeholder management a step-by-step approach for implementing CSR can be developed (Fig.1).

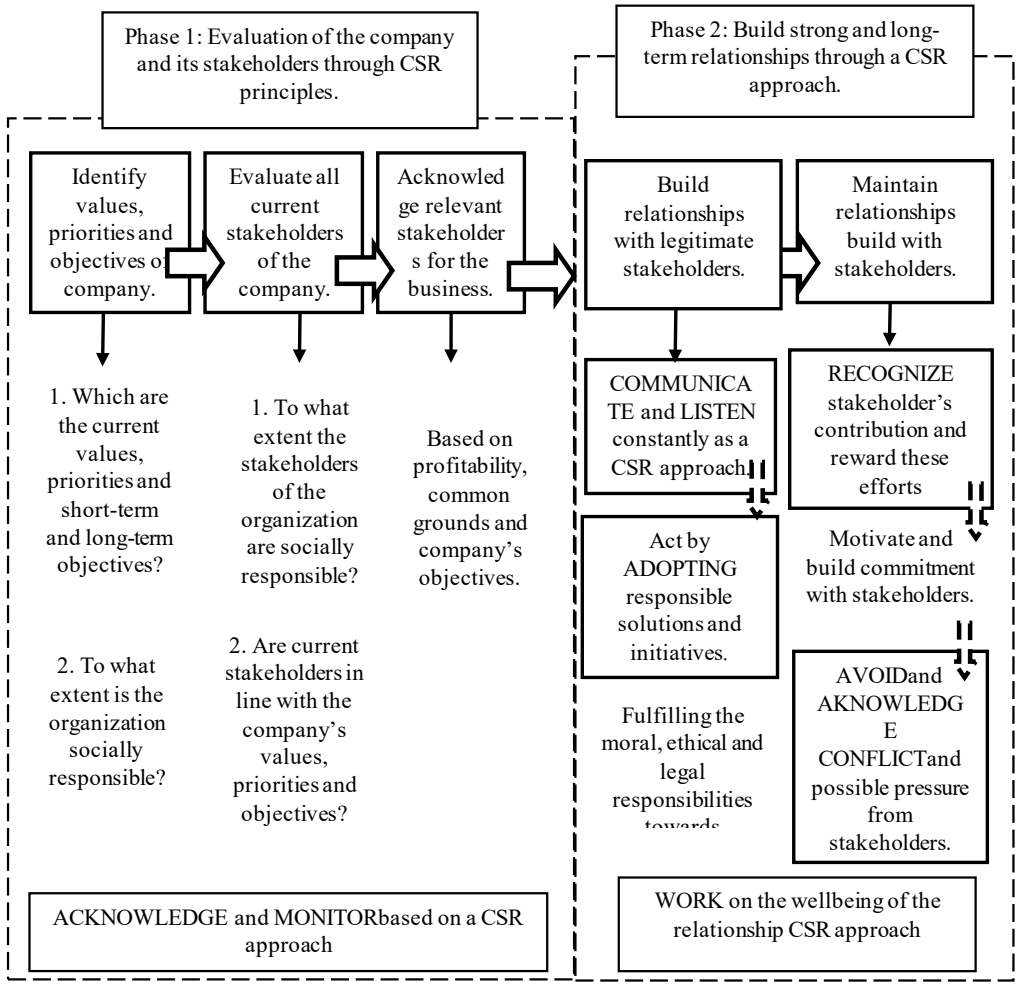

Figure 1: *Framework for implementing CSR in managing stakeholders*

Source: Author's own contribution based on literature review analysis

As a first step, managers should make an assessment regarding its own values and current objectives. Afterwards, an evaluation of internal and external stakeholders based on the firm's priorities is required. In this phase of the process managers acknowledge and monitor in a responsible manner the current relationships established by a company with its parties of interest and evaluates potential and recognizes both concerns, the company's and the stakeholder's ones. Secondly, relationships with relevant parts of interests should be grown and maintained. Managers can contribute to the wellbeing of these relationships by communicating constantly and listening to stakeholders. If the concerns that have been raised by partners are legitimated, then companies should act in consequence and restore the balance by adopting responsible practices, policies and initiatives. Thus, relationships can be sustained by developing commitment. Fulfilling the moral, ethical and legal duties contributes significantly to the avoidance of conflicts and welfare of collaborations established. Partnerships suppose working together and recognizing each of other's contributions and reward these efforts accordantly.

5. Conclusions

Businesses can no longer function properly without considering the needs of various partners, such as the society and other relevant stakeholders. Some of a company's duties seem to be obvious while others, more or less, have a voluntary character. For example, the responsibility of the firm to serve the financial interests of shareholders and provide employee satisfaction could be perceived as a priority for organizations. On the other hand, supporting local communities might be treated as an optional obligation for companies. Active companies, of any kind, do have an impact among various stakeholders and all the affected parties usually have expectations that are supposed to be meet by firms.

Indeed, existing studies revealed that economic entities, regardless of their type or dimension, do not benefit from financial resources or capabilities to fulfill unmet needs of all stakeholders. In this case, the management approach is extremely important. Social and economic development can be approached unquestionably through a CSR orientation. CSR covers a variety of stakeholders and needs. CSR enables companies to manage efficiently stakeholders and to build and maintain partnerships created based on ethical, moral and legal considerations.

This paper presented the manner in which CSR practices can be included in the most used principles regarding stakeholder's management theory elaborated by Clarkson. Similar approach for developing an understanding of how stakeholders can be managed through CSR has been followed by other authors, for instance Ferell (2015). Further studies can be conducted in order to improve the proposed model regarding the implementation of CSR in management practice of stakeholders.

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Green cities - a key element of the sustainable economy

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Abstract: *Sustainable management in the field of sustainable cities is extremely important because cities continue to grow at an extremely high global rate. Cities are very important to the world economy, because more than most people live in urban areas. The research conducted in this paper aims to show the impact of sustainable cities and the importance of their development in the world economy, given their many benefits - environmental, social and cultural. Authorities also need to take appropriate economic policy measures to improve all urban sectors, depending on local specificities and development needs. The methods used, both quantitative and, in particular, qualitative, highlight the role of sustainable, green and smart cities and sustainable management, taking into account the fast changes in the evolution of urban population and urban life worldwide.*

Keywords: sustainable management, sustainable cities, smart cities, green urbanization

JEL: A12, A13, E24, E61, F42, F53, I15, I31, J11, O18, O32, O44, Q20, Q56

1. Introduction

Cities are very important for the world economy as more than most of the people live in urban areas, 55% as a global average, the sustainable economy means having greener and cleaner cities in which to reduce or eliminate social inequities and negative effects on the environment to be more economically efficient. Worldwide, more than four billion people live in cities and within the European Union the urban population represents over 2/3 of the total population. According to the forecast made by international organizations, in the middle of this century the urban population will reach a percentage of 68% of the total world population (United Nations Department of Economics and Social Affairs, 2018).

Due to high energy consumption (between three and four-fifths of the world's energy consumption) from the intense activities that take place inside cities, they are responsible for most of the greenhouse gas emissions, given that on an area of only 3% of the Earth's, they produce four-fifths of the global gross domestic product (GDP). The importance of green cities stems from the fact that, compared to traditional cities, their impact on the environment is smaller, the social domain is given more importance because social equity and quality of life are visibly improved and there is a greater possibility for research units to collaborate with universities and all the other economic actors interested in it. The degree of innovation is higher and therefore, the productivity is higher, both as a result of the positive effects determined by the technological progress, as well as the fact that there is an improvement in the health system and in the working environment for citizens, which also leads to a reduction in costs and to an increase in profits. At present there are fewer green cities in their entirety but rather cities that have implemented different types of green projects.

The possibility of developing only sustainable cities faces the problem of the rapid pace of urbanization which is manifested both by developing and by increasing the size of cities and by transforming some rural areas into cities. Increasing urbanization means solving many new problems, primarily related to increased resource consumption, including the energy and increased flows of goods and people. In order to achieve these objectives, all the decision-makers have an important role to play, from the level of each economic subject to the national and global level.

It is said that "managers design and implement organizational strategies and policies, the fundamental objective of which is to obtain sustainable competitive advantages. … Entrepreneurs and managers need to gain the support of leaders in substantiating, adopting and implementing organizational change projects, which are essential in an increasingly dynamic business environment" (Ionescu, 2020). Achieving competitive advantage constitutes a key issue not only for the top management of any organization but also of any city and country competing in an increasingly turbulent environment, characterized by continuous innovation and digitalization. In this respect, managers have to design and implement their own competitive strategies in order to face today's hyper-competition worldwide.

In the green cities, the emphasis is also on the access of all categories of population to various services and activities. The more compact forms of the city are considered to be more advantageous because they reduce transport distances, making them more energy efficient, even by reducing the energy demand for infrastructure. It has been shown that medium-sized cities are

the most efficient in terms of energy consumption and are also notable for their outstanding efficiency in the field of the public transport. In cities where residential areas are close to commercial areas and public transport is well developed, individuals have much shorter distances and they can travel much easier and more efficiently, saving time and other resources.

Green cities also allow the creation of complex patterns of production and consumption, such as the fact that certain industries can use as raw materials produced in other industries to which they have very easy and quick access. In the green cities are developing the industrial clusters. This is one of the most important economic benefits of green cities, along with low congestion cost and low operating and infrastructure costs. Along with the economic benefits, green cities also offer social benefits, embodied in improving the quality of life by reducing poverty, increasing social equity and creating new jobs, many of which being green jobs in green fields. The health and environmental benefits are consisting in reducing the risks and the pollution, in improving the human health and the services of ecosystems.

Creating green cities means greening the urban sectors such as transport, buildings, energy, vegetation, landscape, water, food, waste, infrastructure, digital technology. Currently, many countries in the world are trying to respond positively, through the proposed government programs, to the 11th goal of sustainable development, which is creating the sustainable cities and communities, open to all, safe, resilient and sustainable.

The research conducted in this paper aims to show the impact of sustainable cities and the importance of their development in the world economy, given their many benefits - environmental, social and cultural.

2. Literature review

"Some cities have experienced population decline in recent years. Most of these are located in the low-fertility countries of Asia and Europe where overall population sizes are stagnant or declining. Economic contraction and natural disasters have also contributed to population losses in some cities." (United Nations Department of Economics and Social Affairs, 2018)

However, the growth rate of urbanization is particularly high in low and middle-income countries, where the authorities must focus primarily on achieving adequate management of urbanization intensification in all urban sectors. Authorities must be constantly concerned with improving the living conditions of citizens in both urban and rural areas, encouraging the strengthening of ties between them, and also seeking to improve economic, environmental and social conditions in a creative society. Given the particularly rapid pace of urbanization, the authorities need to be concerned with ensuring that all individuals have access to infrastructure and social services, focusing on the needs of disadvantaged groups.

Green cities are also called, by some authors, ecocities, these are environments in which it is desired to improve the conditions and economic, environmental and social conditions, in the long run, there is concern for the living conditions of the next generation. According to Sustainable Development Goal 11, sustainable cities are those that offer "opportunities for all through an inclusive design, as well as maintaining sustainable economic growth. The focus also includes

minimizing energy, water and food supplies and drastically reducing waste, heat production, air pollution - CO2, methane and water pollution." (https://en.wikipedia.org/wiki/Sustainable_city, 2021)

The Green Cities Initiative of the Food and Agriculture Organization of the United Nations "focuses on improving the urban environment, strengthening urban-rural linkages and the resilience of urban systems, services and populations to external shocks. Ensuring access to a healthy environment and healthy diets from sustainable agri-food systems, increasing availability of green spaces through urban and peri-urban forestry, it will also contribute to climate change mitigation and adaptation and sustainable resource management." (Food and Agriculture Organization of the United Nations, 2021). Cities need to network and cooperate with each other to exchange good practices.

A topic that has been much discussed in recent years is smart cities. A marts city is "a technologically modern urban area that uses different types of electronic methods, voice activation methods and sensors to collect specific data. Information gained from that data are used to manage assets, resources and services efficiently; in return, that data is used to improve the operations across the city. This includes data collected from citizens, devices, buildings and assets that is then processed and analyzed to monitor and manage traffic and transportation systems, power plants, utilities, water supply networks, waste, crime detection, information systems, schools, libraries, hospitals, and other community services." (https://en.wikipedia.org/wiki/Smart_city, 2021)

Emphasizing the importance of cities as a whole made up of individuals who form a cohesive community, the author Paul Downton launches the idea of Ecopolis. "Civilizations come and go .... That we are now living in a time of changing climate seems beyond reasonable dispute what is in question is whether it is a period of slow or rapid change. There are gradualist and catastrophist schools of thinking about the rate of change. Until the industrial era the rate of change of the built environment was relatively slow..... We have got used to the idea that our buildings, towns and cities could adapt gradually to any changes demanded of them. Much of that adoption has been in the response to human demands, often because of increasing knowledge about better ways to construct human habitat - one thinks of the changes precipitated by better understanding of sanitation, like undergrounding sewers, or the need to conserve energy, resulting in building codes that required better thermal performance." (Downton, 2009) "The global economic crisis is a crisis of civilization..... Cities may have started as human scale creations but their impact on the environment was limited only by the available technology and a pre-fossil fuel energy base. ..... My Ecopolis concept of development is a response to this history. It is an attempt to return to the human scale in city making, to return to the idea of city as community, and to make the city the center of restorative activity rather than destruction, in dynamic balance within itself and with the nature of the land that supports it." (Downton, 2009)

According to the author Richard Register, ecocities are the cities of the future. They aim to reduce pollution and congestion, associated with increasing accessibility, with an emphasis on transport and the design of cities from an architectural point of view, emphasizing the role of business models and planning. Ecocities require the use of ecological principles to ensure their

long-term sustainability and the protection of biodiversity. He is one of the few authors who emphasizes that the shape of a city is of particular importance. "Cities are by far the largest creations of humanity. Designing, building and operating them has the greatest destructive impact on nature of any human activity.... Ecocities proposes a fundamentally new approach to building and living in cities, towns and villages, an approach based on solid principles from deep history and an honest assessment of a trouble future." (Register, 2006).

The author Timothy Beatley explains the concept of the new green urbanism. "Green urbanism effectively captures both the central urban and environmental dimensions. .....the important role of cities and positive urbanism in shaping more sustainable places, communities, and lifestyles….. Our old approaches to urbanism - our old views of cities, towns and communities - are incomplete - and must be substantially expanded to incorporate ecology and more ecologically responsible forms of living in settlement." (Beatley, 2000)

Recognizing the importance of green cities for the future of the sustainable economy, the European Union launched The European Green Leaf Award. "The European Green Leaf Award is presented on an annual basis by the European Commission in conjunction with the European Green Capital Award" (European Commission, 2021).

3. Research methodology

Quantitative variables and graphical representations come, for the most part, from international and European Union publications on green, sustainable and smart cities. The results of the quantitative and qualitative research and analysis were based on the Reports published by the European Union and the United Nations on green and smart cities, improved energy and water consumption, measures to prevent the generation of municipal solid waste and collection and also their processing, to the wider use of renewable energy, to make more obvious progress on transport, with a focus on public transport, to the implementation of a new concept on industrial and consumer models, to improve strategies for the implementation of urbanization plans, to reduce the congestion, to raise the living standards and to use the digitalization. The qualitative research in this paper aims to show the importance of transforming our cities in sustainable or smart cities, which brings us many economic, social and environmental benefits, preserve biodiversity, improve living conditions and living standards.

4. Results and discussion

The results highlighted through the re- search in this paper show that make cities more sustainable and smarter is an important goal because, worldwide, more than four billion people live in cities. Due to the high consumption of energy in the intense activities inside the cities, they generate about four-fifths of the world greenhouse gas emissions, but also produce about four-fifths of the global GDP on an area of only 3% of the world's land.

The most important problem concern the use of the water and energy, the waste collection and processing, the recycle of the materials, the use of renewable energies, the transport system, the industrial innovations and the consumption models, the urbanism plans, the congestion, the

living conditions and the digitalization.

The growing rate of urbanization means solving a number of problems related to the flows of goods and people, the size of cities and the transformation of some rural localities into cities.

Taking into account the increase in the size of the cities, their shape and density must be taken into account so as to reduce congestion phenomena, to increase energy efficiency, to reduce transport distances, heating and cooling costs and to reduce the energy consumption for infrastructure. In green cities are more complex models of production and consumption, there is an urban synergy.

Green cities are also an environment in which the population is more productive due to better working conditions and the intensification of the innovation process, incomes are higher and unemployment is lower, and there are more green jobs.

In green cities, community cohesion is stronger, social relations are more frequent, which is considered to have a particular impact on the physical and mental health of citizens and on increase in productivity and in economic resilience.

In a green city have to achieve the greening of each or of a large part of the urban sectors, such as transport, buildings, energy, vegetation and landscape, water, food, waste, infrastructure and digital technology.

"As the world continues to urbanize, sustainable development depends increasingly on the successful management of urban growth.". (United Nations Department of Economics and Social Affairs, 2018)

The European Commission considers that the local authorities are the key to making progress in increasing the number of green cities in the European Union. It has set up the European Green Capital Award to promote and reward greening efforts in cities and to encourage the exchange of best practices between European cities.

4.1. Characteristics and benefits of the green cities

Cities are an important part of today's economy as more than a half of the world population lives in urban areas. The sustainability of the cities is necessary because, in green cities, the standard of living is higher and multiple economic, social and ecological benefits are obtained.

"Cities are hubs for ideas, commerce, culture, science, productivity, social, human and economic development. Urban planning, transport systems, water, sanitation, waste management, disaster risk reduction, access to information, education and capacity-building are all relevant issues to sustainable urban development." (United Nations, Department of Economic and Social Affairs, 2021)

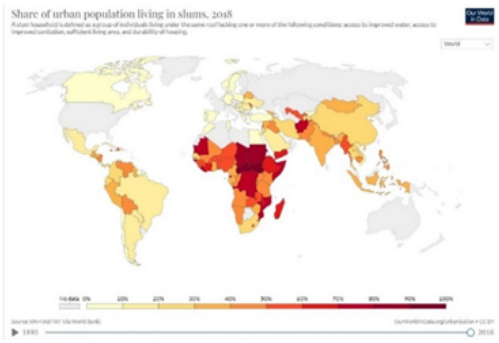
In order to increase the social effects of the process of transition to urban sustainability, it is also important how organizations manage to attract the best human capital. "Nowadays, the interest for attracting talented employees represents one of the most significant organizational goal. The talents role in the organization has been highlighted in the last decades as an important asset in creating added value to the company." (Josan, 2020)

The 11th goal (2015) of the Sustainable Development Goals, refers to sustainable cities and

communities. The proposed targets until 2030 refer to various aspects that characterize a city, starting from its shape to the living conditions of its inhabitants. It is expected that all residents will have better living conditions, better health care, access to safe, fair and sustainable transport, public transport will be developed, with an emphasis on the needs of disadvantaged groups. The population must be empowered to live more sustainably in all respects. Environmental conditions are also improved by reducing the risk of floods or landslides, improving the quality of ecosystems, and reducing pollution. Particular attention is also paid to maintaining the natural and cultural heritage, improving urban architecture and developing spatial planning and urban planning programs linked to local, sectoral and national strategies.

The increase in the size of cities has also led to an increase in the number of informal dwellings, which affect the health and activity of their inhabitants, as well as air quality. Target 11.1 is "By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums". The highest values of the share of the population living in poor conditions in the slums, in 2018, are found in Africa, where there were percentages over 85% and even 90% in some countries, and in Asia the highest value was 70%. To address these issues, countries need to adopt national urban planning policies, which has already been achieved in more than 150 countries worldwide.

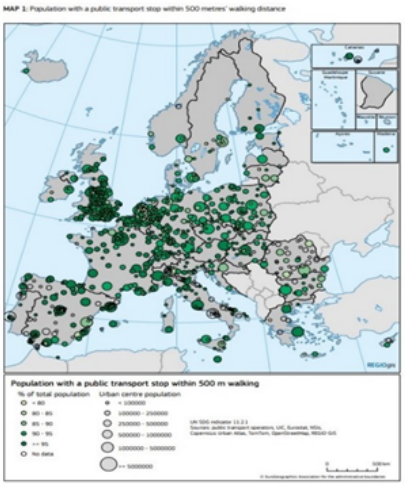
Chart 1: Share of urban population living in slums. 2018



Source: https://ourworldindata.org/grapher/share-of-urban-population-living-in-slums

The target 11.2 is "By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons". This form of transport refers to the fact that individuals must be able to take benefit of the public transport at a reasonable distance, it means that the low-capacity stations must not be more than 500 m and those of high capacity must be within 1 km walk.

Chart 2: Population with a public transport stop within 500 meters walking distance – in European union (2020)

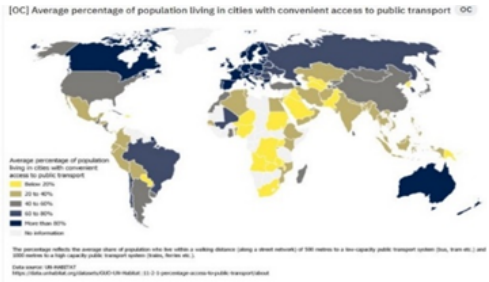


Source: https://ec.europa.eu/regional_policy/sources/docgener/work/012020_low_carbon_urban.pdf

Worldwide, it can be observed that the population's access to public transport is better in the more developed countries, is better in urban areas and yet, worldwide, only a maximum of half of the urban population has easy access to the public transport.

In the European Union, using the indicators for measuring the convenient access to the public transport, expressed in minutes of walking - meaning a maximum of five minutes to a small capacity station and a maximum of 10 minutes to a high capacity station -, in both large cities with over 500,000 of inhabitants and medium-sized ones, the share of the population that does not have convenient access to the public transport registers relatively large variations being grater then 1% and less than 30%. In calculating them, the indicators take into consideration the obstacles that pedestrians may encounter in their path and also the density of the road network. Although there is a strong concern in the urban environment to achieve this goal, given the growing trends in the urban population, rural areas are not neglected either, given the importance of the participation of all the citizens, including the rural population, in civic and social life.

Chart 3: Average percentage of population living in cities with convenient access to public transport (2021)

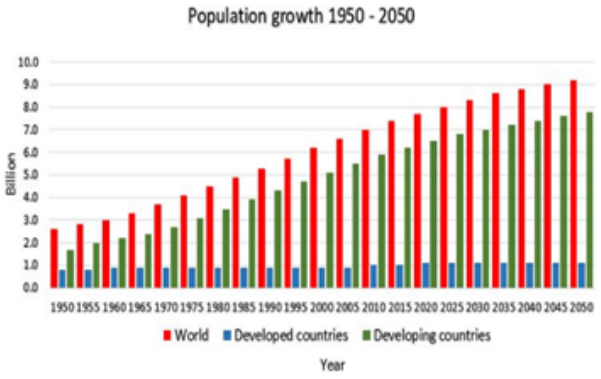


Source: https://www.reddit. com/r/transit/comments/pclogm/ oc_average_percentage_of_population_living_in/

The target 11.3 is "By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries". Achieving this goal can be studied using as indicators - the comparison, as a report, of the growth rate of land consumption with the growth rate of the population and also with the indicator showing the share of the cities that have a structure of direct participation of the civil society to the urban planning and management and which operates in a regular and democratic manner. The first indicator measures the efficiency of a city's land use. Changes in the global population structure are becoming more pronounced. The trend shows a continuous growth in the urban population, which is estimated to reach 70% of the world average in 2050.

In this context, it is very important how they are used the additional land areas for the expansion of cities, which will have to absorb the additional population. In expanding the area of cities, it must be taken into account that they must have a certain level of optimal congestion, to ensure that the needs of the population are met as well as possible, to ensure proximity to the shopping centers, parks, cultural centers, medical services, easy access to work, but, however, this purpose must be achieved in such a way that a reasonable density per square meter is not exceeded, which would hinder the flow of goods and services. The rapid growth of the urbanization produces now a trend in some cities to expand land in an unsustainable way. In order to correct this trend, public authorities must encourage the participation of all in proposing solutions to address the issues related to the development of the city and making it more sustainable.

Chart 4: Population growth



Source: https://www.canr.msu.edu/news/feeding-the-world-in-2050-and-beyond-part-1

Chart 5: City resilience and sustainable development

Source: https://www.mdpi.com/2071-1050/11/19/5514/htm

The target 11.4 is "Strengthen efforts to protect and safeguard the world's cultural and natural heritage."

Given the importance of natural and cultural heritage worldwide, the authorities measure the achievement of this objective by the total expenditure per capita, from public and private funds, starting at the local level and continuing with all other intermediate levels to the national level. Achieving this goal is very difficult to analyze because many of the world's countries do not have specific indicators that shows the use of their financial resources for this purpose.

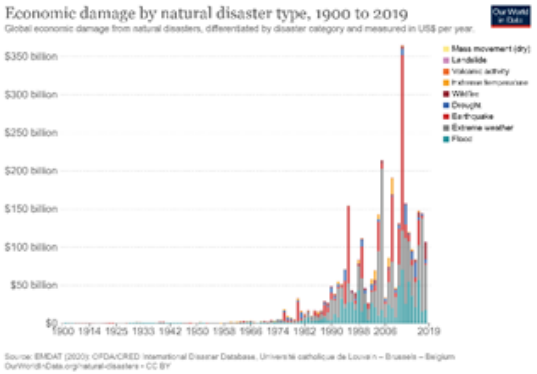
Chart 6: Culture and sustainability cloud

Source: https://www.google.com/search?q=cultural+investments+worldwide&tbm=isch&ved=2ahUKEwjl89Tlh-30AhUKchQKHVf_AVYQ2-cCegQIABAA&oq=cultural+investments+worldwide&gs

The target 11.5 is "By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations". "According to a recent report released by Aon, at least 416 notable natural disaster events occurred on a regional, peril, or event-level scale in

addition to pandemic-related events in 2020, which was higher than the average (384) and median (390) since 2000. The estimated direct economic losses and damages caused by these natural disasters were about US$268 billion, which was higher than the average of the 21st century by 29%" (https://en.wikipedia.org/wiki/Sustainable_Development_Goal_11)

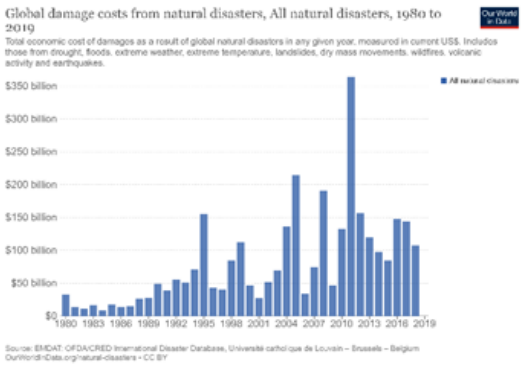
Chart 7: Economic damage by natural disaster type, 1900 to 2019



Source: https://ourworldindata.org/grapher/economic-damage-from-natural-disasters?country=Mass+movement+%28dry%29~Landslide~

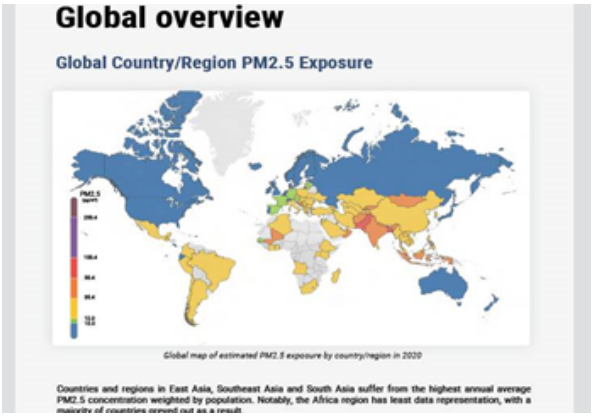
Measuring these types of damage, especially in key vulnerable sectors, is useful because the authorities can take appropriate economic policy measures. In order to determine the effects of these disasters, in general, the countries compare the damage caused by a particular disaster with its evolutionary trend and taking into account, at the same time, the number of the population and the value of the affected assets. The analysis of this indicator raises a number of issues related to the possibility of determining future trends as, for example, in the European Union, in the last 40 years, most losses from disasters caused by extreme weather and climate phenomena - about four-fifths of the total and about 3% of GDP - have been caused by less 5% of events.

Chart 8: Global damage costs from natural disasters, all natural disasters, 1980 to 2019



Target 11.6 is "By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management." This target can be evaluated, on the one hand, by the share of polluting particles in the air of cities and, on the other hand, by the measures of collection, processing and recovery of waste. Nearly 50% of the urban population suffers from an air pollution level at least 2.5 times higher than the recommended levels, affecting mainly low- and middle-income countries in the Western Pacific and Southeast Asia. The measures to be taken in the field of waste are complex measures because they cover, in addition to the economic sector, also other several sectors, such as the social, political and technological ones.

Chart 9: Global air pollution, 2020



Source: https://www.google.com/search?q=world+most+polutted+capital+cities&tbm=isch&ved=2ahUKEwjRqYuKme30AhVdgM4BHU00AQIQ2

Chart 10: Integrated waste management

Source: https://www.google.com/search?q=waste+management+in+the+urban+areas+&tbm=isch&ved=2ahUKEwiD4JySmu30AhUByRQKHYnAAekQ2-

The target 11.7 is: "By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and Persons With Disabilities". Authorities calculate the average share of the urban areas that are open to the public for all citizens, regardless of gender, age and disability within cities, and also by the indicators that reflect the share of the victims of physical or sexual harassment within one year.

Chart 11: Public and green spaces in the context of sustainable development

Source: https://www.google.com/search?q=access+to+safe+and+inclusive+green+and+public+spaces&tbm=isch&ved=2ahUKEwjax66cmu30AhW4AGMBHbMIAqIQ2-cCegQI

It is observed that, in general, over the last 30 years, the area built per person in the cities has increased worldwide, and the share of land occupied by green spaces has also been increasing - the highest values being in Australia and New Zealand - which contributes to increasing the level of general health and well-being. However, inside the cities, on world average, the area occupied by streets in the world is three times larger than that occupied by open public spaces, such as parks. (United Nation, Economic and Social Council, 2020)

4.2. Sustainability and smart cities

"A smart city is a technologically modern urban area that uses different types of electronic methods, voice activation methods and sensors to collect specific data. Information gained from that data are used to manage assets, resources and services efficiently; in return, that data is used to improve the operations across the city. This includes data collected from citizens, devices, buildings and assets that is then processed and analyzed to monitor and manage traffic and transportation systems, power plants, utilities, water supply networks, waste, crime detection, information systems, schools, libraries, hospitals, and other community services." (https://en.wikipedia.org/wiki/Smart_city#Characteristics)

Given that the most polluting sectors are the transport industry and buildings, the focus in smart cities should be mainly on them. In industrial activities, this means ensuring the operation

and performance of real-time performance for modern operations, which requires the introduction into production of automation, artificial intelligence, robotics and industrial IoT (Internet of Things).

Because individuals spend nine-tenths of their time indoors, it's essential to use technology in this area as well. This technology refers to the use of sensors to determine the improvement of the climate inside the home and to determine patterns of behavior of residents, which can be stored so that buildings are as friendly as possible to those who live in them and as efficient as possible, from an economic and ecologic point of view.

In the field of transport, the major changes relate to the introduction of autonomous driving, which will change traditional mobility.

Smart Cities in the medical field means improving the equipment used in the medical activity, along with improving the methods of treating patients.

The use of smart technologies also aims to ensure a better life for humans and animals, including insects, so that the necessary food is provided and biodiversity is improved. These systems can record, for example, the behavioral patterns of insects in cities and ensure their contribution to increase biodiversity.

Smart cities also mean using modern technologies to analyze and optimize the way water is consumed in the city, both inside and outside buildings.

IoT devices, smart cameras, use innovative technologies, based on which, with the help of the computers, we can improve the way that cities work, we can optimize the flows of goods, services and people, we can use more efficiently all the resources, the degree of mobility increases, and thus numerous economic, ecological and social benefits are obtained for the residents. The city administration can thus receive information about the city's infrastructure and its community and provide real-time solutions. The quality, the performance and the interactivity of urban services increase, and the interactions between authorities and citizens are stronger and more efficient.

According to the "2020 Smart City Index" ranking, based on economic, technological, and citizens' perceptions of how "smart" their cities are, Singapore ranks first in implementing many smart projects in both public and private sector. Among the most important achievements, the following can be mentioned - contactless payment technology is used to facilitate traffic and payments for those who use the public transport, and the concern for the health of citizens has materialized in the use of a digital health system. It is also planned to build an eco-city with over 40,000 homes without vehicles.

In the second place, in the same top, is the city of Helsinki, where the focus has been on reducing the carbon emissions, in order to become neutral by 2035. Given that much of the emissions come from the transport and the building sectors, the measures referred to the reduction of the traffic emissions by using only electric buses for the public transport, by expanding underground subway networks and by multiplying charging stations for electric vehicles. With regard to buildings, the authorities have focused on increasing energy efficiency during renovations, which would significantly reduce emissions from buildings.

In Zurich – third place -, the first smart project was carried out in the field of street lighting with sensors, which achieved significant savings in energy consumption, by adapting the light intensity to the traffic. The sensors also collect environmental data, measure traffic flow and act

as public WiFi antennas. A very high efficiency was also recorded for the energy consumption for regulating the temperature inside the buildings.

The fourth smart city, Oslo, aims to run only electric cars and buses by 2025, and the authorities encourage this by incentives for zero-emission cars, free parking, lower taxes. There are projects for zero-emission construction sites and circular waste management and green energy systems are used in the field of buildings.

In fifth place is the first smart city in the world - Amsterdam, in the Netherlands. Some of his projects in this field are the introduction of energy meters in households that brings benefits to those who constantly reduce their energy consumption, the possibility that individuals who have a parking place to rent it, which helps to calculate the total demand for parking places, as well as the possibility to automatically adjust the intensity of street lights according to the intensity of traffic. There are floating areas in Amsterdam for more efficient land use and to combat overcrowding.

In on the 6th and 7th places, there are, in this order, New York and Seoul. In New York sensors have been installed that collect data for more efficient waste collection management, smart hubs with contactless technology have been put into operation, and car-sharing services are widely used. In Seoul, the main initiatives concern the collection of data for the analysis of urban patterns of the traffic flow, of the air quality and of the potential crime patterns. For elderly people living alone, the sensors monitor if there is movement in a period of time, in order to intervene urgently, if necessary.

Other examples of Smart projects in cities around the world are listed below. In the Spanish city of Barcelona, smart technologies are also being introduced in various fields. A first example is the installation of the sensors for gardening in an important park of the city, which transmit, in real time, the water needs of the plants in the park. The bus network has been redesigned according to the transport needs, and the city benefits from intelligent traffic lights, which are used to optimize the traffic and the transport time and can be managed at the central level of the city, through a specialized platform.

In Brisbane, Australia, devices have been installed on the poles to continuously measure air quality and noise pollution, and in Columbus, Ohio, USA, in order to encourage the purchase and use of electric vehicles, the possibilities of finding the routes with the highest traffic were analyzed, as well as the installation of several charging stations for electric cars on these routes.

In the city of Copenhagen, Denmark, which won the award for the smartest city in the world in 2014, there are installed sensors to monitor air quality and there are encouraged open and transparent public-private partnerships, the communication and the desire of all the economic subjects to use their knowledge in order to solve the problems of the citizens and the city, as a whole.

In Dubai, most government services on transportation, communications, infrastructure, electricity, economic services and urban planning are digitized, making significant savings. An artificial intelligence system is used to monitor bus drivers, which has greatly reduced traffic accidents caused by fatigue.

4.3. The transition to the sustainable cities in the European Union

At the level of the European Union, the European Green Deal stipulates that by 2050, Europe will be climate neutral. To do this, by 2030, net greenhouse gas emissions must reach less than

half of the level reached in 1990, targeting all economic sectors.

The European Commission has set as objectives, based also on a public consultation on the views of stakeholders and citizens, which are included in the fiscal macroeconomic policy measures and are adapted to the local context

- "Set a more ambitious and cost-effective way to achieve climate neutrality by 2050
- Stimulate green job creation and continue EU balance sheet to reduce greenhouse gas emissions as economy grows
- Encourages international partners to increase their ambition to limit global warming to 1.5 ° C and avoid the worst consequences of climate change" (European Commission, 2021)

The strategy for protecting and restoring biodiversity has as its main objective to increase resilience to future threats, such as

- "the impacts of climate change
- forest fires
- food insecurity
- disease outbreaks - including by protecting wildlife and fighting illegal wildlife trade" (European Commission, 2021)

In order to stop the degradation of the biodiversity, to reduce the consumption of resources per unit of product or service achieved, to have a sustainable economic growth, a sustainable consumption and to create new green jobs, the European Union promotes the circular economy.

The European Commission intends, in order to increase energy efficiency, to increase the share of the energy produced from renewable sources, of which wind energy is of a particular importance, taking into account the favorable natural conditions, along with solar energy. Progress would not have been possible without the expansion of a modern energy network, with more connections, but it is also important to change the production methods so that less energy is consumed and products have an eco-friendly, sustainable design. In order to achieve this transformation and better meet the new challenges, the attitude of leaders at all levels is particularly important. "The attitude of the management, expressed concretely by the activity of the leaders on different hierarchical levels, comes to maintain and influence the performances of the organization, to support the dynamics of the change processes and to help, in this way, to design and achieve the strategic vision." (Bolcaș, 2020)

As the European Union has already made significant progress in the field of sustainable agriculture, the focus is now on the transition to a sustainable food system, given the close link between agriculture and food and the multiple benefits, not only economic, but also environmental and social.

"The EU's goals are

- to ensure food security in the face of climate change and biodiversity loss
- reduce the environmental and climate footprint of the EU food system
- strengthen the EU food system's resilience
- lead a global transition towards competitive sustainability from farm to fork" (European Commission, 2021)

The European Union industry needs to demonstrate that it is successfully facing global competition, taking into account the proposed zero carbon targets for 2050. The gradual transformation

of the industry into a green and digital one is the use of cleaner technologies in production and the creation and implementation on a larger scale of new business models.

The transport sector is a key source for the European economy, accounting for 5% of European Union GDP and providing about 10 million jobs, but it also has costs - greenhouse gas emissions and pollutants, noise, road accidents and congestion.

Reducing greenhouse gas emissions requires major changes in transportation.

"The EU Cohesion Policy helps EU countries, regions, local governments and cities to implement large investments that contribute to the European Green Deal. They must devote at least 30% of what they receive from the European Regional Development Fund to these priorities. In addition, 37% of the Cohesion Fund will contribute specifically to achieving climate neutrality by 2050." The measure provides for the involvement of both public and private sectors in the financing of green investments and the development of the research and innovation process. (European Commission, 2021)

At the level of the European Union, local authorities are considered to be the most important in creating as many green cities as possible on their own territory. The European Green Capital Award is a reward for cities that have implemented the principles of a sustainable economy and also aims to encourage the exchange of good practice between European cities.

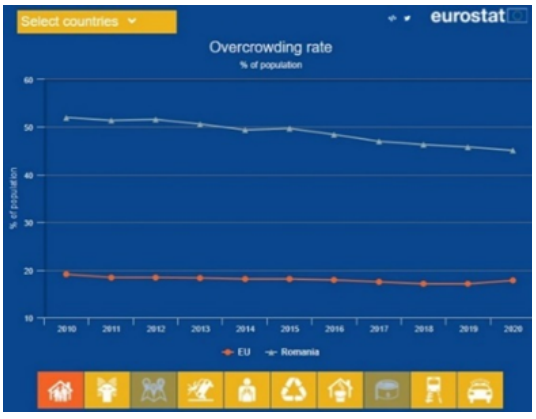
The European Union has implemented a number of economic policy measures, in particular on urban planning and financing. Local authorities are encouraged to use urban nature to improve the quality of life and better adapt to climate change. promoting the circus economy is the key to making cities more sustainable. local authorities are also encouraged to make green, innovative and responsible public procurement.

In the list of the 100 green cities in the world, in 2019, there is also a city in Romania, namely Alba Iulia, recognized for its achievements in the field of renewable energy. This city uses over 95% hydroelectric energy, the rest being solar energy, wind energy and natural gas energy.

The achievements of the last decades at the level of the entire European Union, compared to the progress achieved in Romania, regarding the most important objectives in the transition to green, sustainable, sustainable, smart cities, can be observed in the graphs below:

- reducing the overcrowding rate

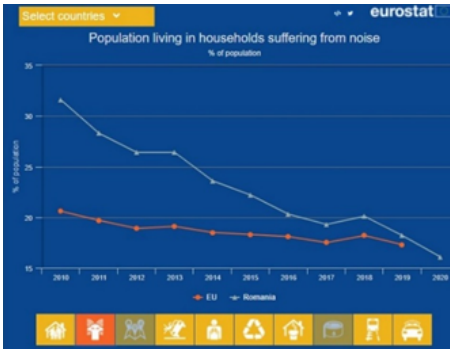
Chart 12: Overcrowding rate



Source: https://ec.europa.eu/eurostat/web/sdi/sustainable-cities-and-communities

- noise reduction affecting the population

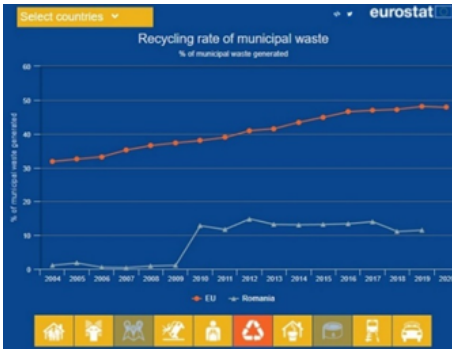
Chart 13: Population living in households suffering from noise



Source: https://ec.europa.eu/eurostat/web/sdi/sustainable-cities-and-communities

- improving the recycling rate of municipal waste

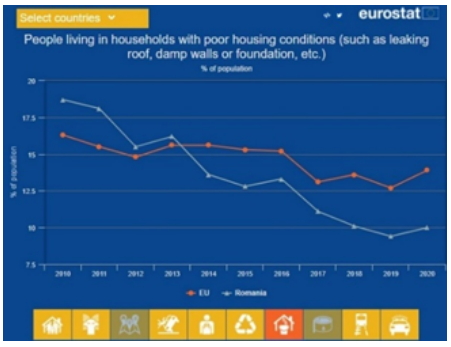
Chart 14: Recycling rate of municipal waste



Source: https://ec.europa.eu/eurostat/web/sdi/sustainable-cities-and-communities

- improving living conditions

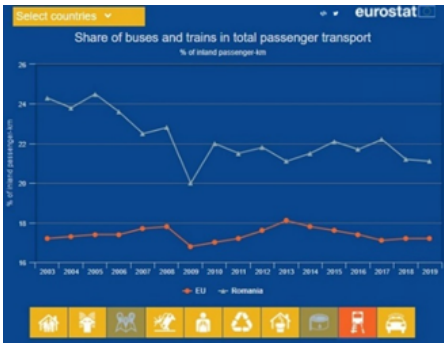
Chart 15: People living in households with poor conditions



Source: https://ec.europa.eu/eurostat/web/sdi/sustainable-cities-and-communities

- the evolution of public transport

Chart 16: Share of busses and trains in total passenger transport



Source: https://ec.europa.eu/eurostat/web/sdi/sustainable-cities-and-communities

5. Conclusions

This article is in line with previous research. Nowadays, the importance of green cities stems both from the fact that a significant increase in urbanization is expected. It is therefore essential that the standard of living in cities and the conditions they offer in all areas are as good and sustainable as possible. Green cities have a lower impact on the environment, promote social equity, equal opportunities, focus on quality of life, there are more research centers, which collaborate with universities and other interested economic actors, so the degree of innovation is more high productivity and higher productivity, all of which lead to a reduction in costs and an increase in profits.

Providing access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, expanding public transport, with special attention to the needs of those in vulnerable situations, requires the authorities implement infrastructure and transport policies, so that people have quick access to the stations, close to their homes and benefit from green means of transport.

In expanding the area of cities, it must be taken into account that they must have a certain level of optimal congestion, so that satisfy as best as possible the needs of the individuals, to ensure proximity to the shopping centers, parks, cultural centers, medical services, easy access to work, but, on the other hand, the congestion must not exceed a certain density per square meter, so it must not become an obstacle to the development of the economic and social activities.

From the local to the national level, the authorities must direct their expenses from public and private funds, in order to protect the cultural and natural heritage. Authorities must also take appropriate economic policy measures to determine possible natural disasters and not only, that may affect cities and to reduce their effects.

The measures to be taken in the field of noise, air pollution and waste are complex measures because they cover, in addition to the economic sector, also other several sectors, such as the social, political and technological ones. Another important target is related on the built area per person in the cities, which has increased worldwide, so as the share of land occupied by green

spaces, which contributes to increasing the level of general health and well-being.

Digitization is also important to make cities more sustainable. The cities that use it extensively to measure different phenomena are called smart cities. They are using the latest modern technology to collect specific data. The data collected from other economic subjects is used by the authorities in order to improve the use of the resources and all operations within the city.

According to "2020 Smart City Index", in the top of the Smart cities in 2020, there were Singapore, Helsinki, Zurich, Oslo, Amsterdam, New York, Seoul.

In the European Green Deal, there are included measures to improve climatic conditions, preserve biodiversity, reduce energy consumption, improve transport, create new production models in industry and agriculture, improve consumption patterns, improve living conditions, reduce air pollution and noise pollution, recycling municipal waste. The European Union has implemented a number of economic policy measures, in particular on urban planning and financing. Local authorities are encouraged to use urban nature to improve the quality of life and better adapt to climate change, and to promote the circular economy is the key to making cities more sustainable. Local authorities are also encouraged to make green, innovative and responsible public procurement.

"To ensure that the benefits of urbanization are fully shared and inclusive, policies to manage urban growth need to ensure access to infrastructure and social services for all, focusing on the needs of the urban poor and other vulnerable groups for housing, education, health care, decent work and a safe environment." (United Nations Department of Economics and Social Affairs, 2018)

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Drivers for entrepreneurial intention. A comparative analysis using statistical tools and techniques

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Abstract: *In recent years, there has been a considerable increase in awareness of the importance of promoting entrepreneurship to the younger generation. The paper aims to analyse the effect of intellectual intelligence, emotional intelligence, spiritual intelligence and creativity on students' entrepreneurial intention. A quantitative approach was used in the form of a survey questionnaire, which was administered to a sample of 197 students in the Faculty of Business and Administration, University of Bucharest, Bucharest, Romania. The findings of the study showed that these cognitive and non-cognitive skills have a positive effect on students' entrepreneurial intention.*

Keywords: entrepreneurship, drivers of entrepreneurial intention, intellectual intelligence, emotional intelligence, spiritual intelligence, creativity, students
JEL: C02, C10, C83, I23, L26

1. Introduction

Entrepreneurship, ever since the First Industrial Revolution, has become a topic of intense interest for stakeholders such as companies, governments and researchers (Grădinaru et al., 2017; Marinescu et al., 2017), and those aiming at reaching economic dominance look at entrepreneurship as a supporting pillar (Grădinaru et al., 2020). Entrepreneurship is a significant source of job creation, innovation and economic growth, as well as higher product and services quality, increased competition, and improved economic flexibility (Hisrich et al., 2007). At the heart of the entrepreneurial process is the entrepreneur, whose role is of high importance in both economy and society.

As fostering the entrepreneurial spirit becomes a key factor for general development and the subject of great interest for scholars and policy-makers, studying the entrepreneurial intention whitin "universities can be seen as potential sources of future entrepreneurs" (Turker and Seluk, 2009). Entrepreneurial intention can be easily decoded as the individual's attitude regarding entrepreneurship (Margaça, Sánchez-García and Sánchez, 2020). As intention is the process prior to the actual behaviour, it is imperative that we try to understand what drives entrepreneurial intention in young people. Over the past decade, multiple factors have been considered to explain entrepreneurial intention. Understanding the factors that influence entrepreneurial intention in young people is crucial as intention is the best predictor of entrepreneurial action (Krueger et al., 2000).

Therefore, to determine the personal abilities that stimulate the entrepreneurial intention, we follow both their cognitive side and the emotional sphere.

The paper aims to determine students' interest in entrepreneurship as a career choice, as well as, measuring scores of entrepreneurial intention and student skills to analyse the effect of cognitive and non-cognitive abilities on entrepreneurial intention.

Based on these considerations, we propose the following hypotheses:

H1: Most of the students surveyed thought about becoming entrepreneurs.

H2: Most of the students perform better in terms of cognitive skills.

H3: Cognitive skills are most often seen as strengths.

H4: Most of the students are faithful and associate spirituality with a way of thinking.

H5: Cognitive intelligence has a positive influence on entrepreneurial intention.

H6: Emotional intelligence has a positive influence on entrepreneurial intention.

H7: Spiritual intelligence has a positive influence on entrepreneurial intention.

H8: Creativity has a positive influence on entrepreneurial intention.

H9: Entrepreneurial intention is linked to student specialization.

H10: Socio-demographic factors influence entrepreneurial intention.

The present paper is structured in five sections. It starts establishing the context of the paper, highlighting the purpose of the conducted study. The literature review is providing the foundation for a theoretical framework, summarising relevant contributions of previous studies addressing entrepreneurial intention. We then describe our research methodology, as well as the collected data, and discuss the main results. The paper ends by pointing out the main conclusions.

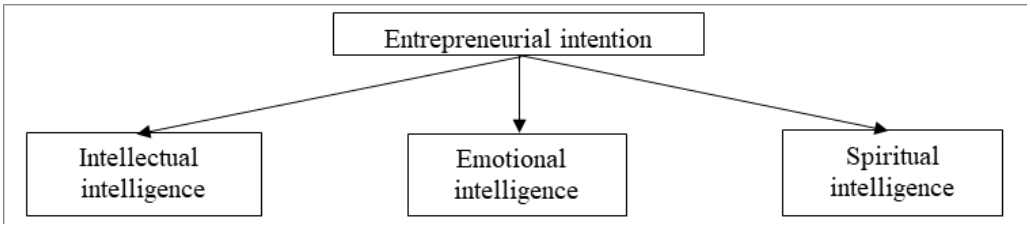
2. Literature review

Entrepreneurship represents a true global phenomenon (Catană et al., 2020) and a key pillar in reaching vast social and economic success, critical for any entrepreneur who wants to "accelerate economic development through generating new ideas and converting them into profitable ventures" (Turker and Seluk, 2009, pp.142). Due to the fact that engaging in entrepreneurial endeavours is a matter of deliberate choice (Obschonka, Silbereisen and Schmitt, 2010, Apud, Krueger, 2007), and that new venture creation boosts overall prosperity (Díaz-García and Jiménez-Moreno, 2010), it is essential to study the specific drivers for entrepreneurial intention. This concept refers to a specific state of mind that directs individuals' focus to achieve a goal (Zhang, Wang and Owen, 2005, Apud, Bird, 1998), to create and implement new business concepts (Nasurdin et al., 2009) in an increasing creative business environment (Toma, 2019; Toma and Catană, 2021).

There are various approaches for entrepreneurial intention among which we can find the psychological approach that refers to the psychological characteristics/traits that are specific and unique to entrepreneurs and that serves as "predictors of the entrepreneurial orientation" (Ferreira et al., 2012, pp.426), or the behavioural approach that can provide strong intentions for self-employment if the person displays behavioural control and self-efficacy (Kickul et al., 2008).

Several studies have been conducted to investigate entrepreneurial intention since research in this field has been a fruitful area of study for many years. According to Fayolle and Liñán (2014), entrepreneurial intent is a well-established research topic in the field of entrepreneurship. Previous research (Zampetakis, et al., 2011) contributes to our understanding of young people's entrepreneurial intentions by explaining the link between young people's creativity and their desire to start a business. Other significant studies have been conducted by Gudiyattam (2018), Radiman, Sukiman and Agus (2021), regarding the effect between entrepreneurial intention and emotional and spiritual intelligence. Recent research (Manik, Sari and Sitepu, 2021) shows that the variables of intellectual intelligence, emotional intelligence and spiritual intelligence influence students' entrepreneurial intention (Fig.1).

Figure 1: Entrepreneurial intention correlated to intellectual, emotional and spiritual intelligence



Source: Authors' contribution

Intellectual intelligence refers to human mental capacity and understanding developed through thinking, showing one's ability of "insight and intelligence to adapt effectively and

dynamically" (Sitepu, Nursiah and Azar, 2020, pp.118). Intellectual intelligence relates to the ability to solve problems, the capacity to convey ideas and execute decisions, elements that can be seen as characteristics of a successful entrepreneur (Sitepu, Nursiah and Azar, 2020).

Emotional intelligence is a mental process (Mortan et al., 2014) referring to the ability to monitor own emotions and those of others, to distinguish them, and to use this information to coordinate thinking and actions (Salovey and Mayer, 1990). Entrepreneurial intention is linked to emotional intelligence because feeling more capable to handle various challenges and frustrations derived from being an entrepreneur implies that the individuals trust their capacity to regulate their emotions (Rodrigues et al., 2019) and, thus, showing self-awareness, self-control, self-consciousness and good management of relations (Dehkordi et al., 2012).

According to Zohar and Marshall (2000), spiritual intelligence can be defined as the ability to deal with issues of meaning and value, the capability to place life in a broader and richer context. Spiritual intelligence enables the individual to apply positive values, allowing problem-solving techniques by using spiritual resources and reaching a greater level of awareness (Sitepu, Nursiah and Azar, 2020). Moreover, it enables "a strong sense of purpose and a high level of motivation" (Fard et al, 2018, pp.169).

Therefore, intellectual intelligence is undoubtedly an accurate predictor of business performance and career success. Emotional intelligence is a prerequisite for success in the workplace, and it is becoming increasingly important in the field of entrepreneurship. Similar to the growing interest in cognitive and emotional intelligence, there is a growing interest in the integration and application of spiritual intelligence in the field of entrepreneurship.

Creativity is the ability to generate, create or discover new ideas, solutions or possibilities. Although creativity is often associated with the arts, it is a vital form of intelligence that causes individuals in different fields to discover something new. Linking creativity to entrepreneurship means defining creativity as "balanced unfolding and converging of experience and entrepreneurship as the management of radical change" (Nystrom, 1993, p.237). This, in turn, implies the existence and the strong role played by a creative entrepreneur, generating innovation and acting as more than an agent of change as he seeks for and exploits change that is seen as an opportunity (Yarzebinski, 1992).

Studying entrepreneurial intention within universities is becoming increasingly important as educational institutions, through their resources, processes and various stakeholders promote student initiative in various forms (personal projects, spin-offs, etc.) and, thus, they stimulate the basis of an entrepreneurial process: seeking opportunities (Grădinaru, Toma and Marinescu, 2018).

3. Research methodology

To reach the research objective of the paper, the authors based their study on the descriptive quantitative research design, also using sources of secondary data such as articles and books. The data for the study were collected from a sample of 197 students from the Faculty of Business and Administration, University of Bucharest, Bucharest, Romania, divided into the following

specializations teaching in Romanian: Business Administration (AA), Public Administration (AP), Economic Cybernetics (CE), Marketing (MK), and one specialization teaching in English: Business Administration (BA).

The questions/statements in this research use a Likert scale (scale 7), which refers to a scale used to measure a person's attitudes, perceptions and opinions about different social issues (Anderson, 2020). The questionnaire was organized into six sections. The first section measures the entrepreneurial intention, the following four sections measure the abilities including intellectual intelligence, emotional intelligence, spiritual intelligence and the creativity of the students, while the last section measures the demographic variables.

The definition and operational variables according to this study are stated below.

Intellectual intelligence is the ability to make decisions and solve problems logically and ratio and can be measured using indicators like analytical, verbal and numeric skills.

Emotional intelligence is the ability to effectively perceive, understand and manage emotions and can be quantified considering its five dimensions: self-awareness, self-regulation, self-motivation, empathy and social skills.

Spiritual intelligence is the ability to use spiritual resources to solve certain problems. Indicators of spiritual intelligence include problem-solving through spiritual resources, a higher level of self-awareness, detachment from negative emotions and replacing them with positive emotions.

Creativity is the ability to take a new approach to decision-making and problem-solving. Creativity can be assessed by indicators such as flexibility and adaptability to change, the courage to take risks in making decisions, thinking "out of the box".

The survey data were analysed using various statistical analysis techniques and the statistical analysis tool RStudio. With this tool, descriptive statistics like mean, median, standard deviation were calculated, as well as statistical techniques such as ANOVA that also include tests used at checking its assumptions (Shapiro-Wilk test, Bartlett's test, Levene's test). The analysis of variance (ANOVA) is applied when more than two groups of subjects are compared (Miller, 1997).

4. Results and discussions

According to the responses, 87% of respondents have so far considered becoming entrepreneurs, while 13% of them have not thought about this. The ability to make decisions and solve problems logically and rationally receives the most votes, accounting for 38% of them. In terms of gender, 91% of female respondents considered becoming entrepreneurs, while a lower percentage of male respondents, 82%, considered doing so. Based on the residence, 88% of rural respondents thought about becoming entrepreneurs, while 86% of urban respondents considered it.

The descriptive statistics for the main variables of interest to the current study, including entrepreneurial intention, intellectual intelligence, emotional intelligence, spiritual intelligence, creativity scores, are presented in Table 1.

Table 1: The empirical results of descriptive statistics

Variable	Mean	Median	Max.	Min.	Standard deviation	Coefficient of variation
Entrepreneurial intention	10.85	11.00	14.00	2.00	2.759705	25.42853%
Intellectual intelligence	30.70	28.00	35.00	14.00	4.761308	15.50889%
Emotional intelligence	27.92	28.00	35.00	13.00	4.416954	15.81785%
Spiritual intelligence	16.81	17.00	21.00	3.00	3.216706	19.13319%
Creativity	28.21	29.00	35.00	13.00	4.238109	15.02443%

Source: Authors' contribution using RStudio software

The five coefficients of variation record values <30%, which indicate that the five means of these variables are representative, the variance being low and the data sets homogeneous.

Table 2: Entrepreneurial intention and abilities scores based on students' specialization

Specializations	Entrepreneurial intention	Intellectual intelligence	Emotional intelligence	Spiritual intelligence	Creativity
Business Administration (AA)	11.61	30.72	27.19	17.43	28.07
Public Administration (AP)	9.433	29.87	29.48	16.17	28.83
Economic Cybernetics (CE)	9.794	31.71	26.94	15.79	27.26
Marketing (MK)	10.23	29.63	27.73	17.13	28.94
Business Administration (BA)	12.23	31.39	29.37	16.81	28.23

Source: Authors' contribution using RStudio software

Table 2 shows the average entrepreneurial intention score, as well as the average skill score.

According to these observations, we can notice that the highest entrepreneurial intention score (12.23) is recorded in BA specialization. CE specialization excels in intellectual intelligence (31.71), while AP specialization is proficient in emotional skills (29.48). Regarding spiritual intelligence, the highest score (17.43) corresponds to the AA specialization, and the best performance in creativity (28.94) is noticed in MK specialization.

Since the dependent variable is quantitative, in the form of scores and the other variables are categorical, we chose the ANOVA technique as a statistical model, to highlight the links between entrepreneurial intention and the four skills, but also to illustrate the connection between entrepreneurial intention and specialization.

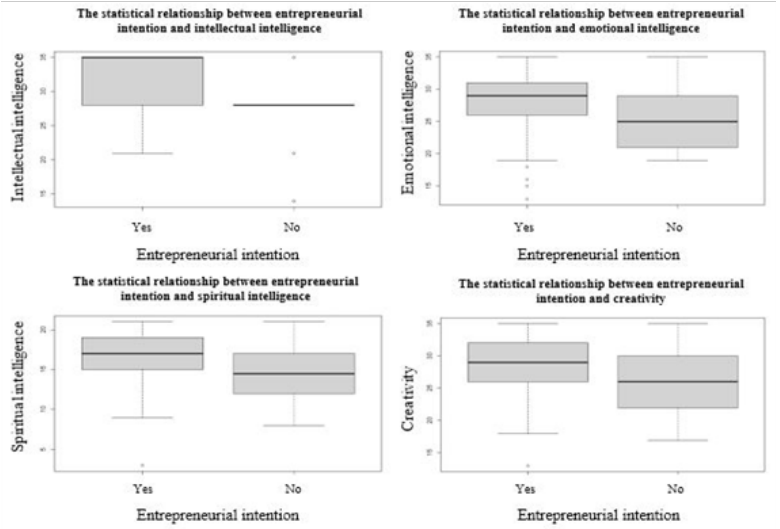
Table 3: The empirical results of ANOVA: Intellectual intelligence, emotional intelligence, spiritual intelligence, creativity and entrepreneurial intention

Variable	F	P-value
IQ	20.75	9.2e-06
EQ	11.39	0.000889
SQ	20.59	9.93e-06
Creativity	8.136	0.00481

Source: Authors' contribution using RStudio software

According to the several One-Way ANOVA analysis conducted and illustrated in Table 3, we observed that there is a statistically significant relationship between intellectual intelligence and entrepreneurial intention (p-value = 9.2e-06 < 0.05). The same conclusion can be outlined regarding emotional intelligence (p-value = 0.000889 < 0.05), spiritual intelligence (p-value = 9.93e-06 < 0.05) and creativity (p-value = 0.00481 < 0.05). Thus, we demonstrated the positive effect between entrepreneurial intention and the four skills.

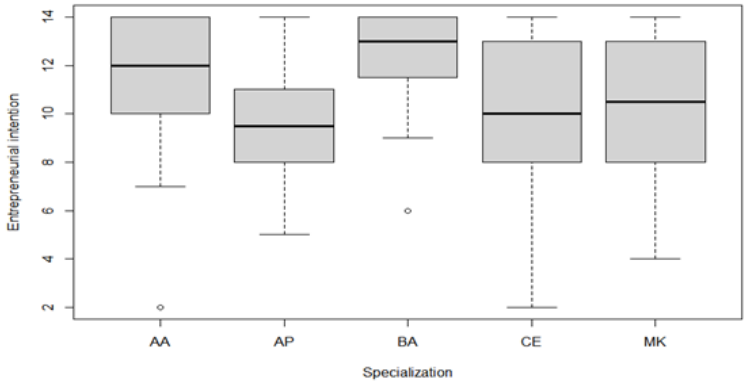
Figure 2: The statistical relationships between entrepreneurial intention and the abilities



Source: Authors' contribution using RStudio software

Based on the boxplots displayed in Figure 2, it is notable that the abilities scores are higher when there is an entrepreneurial intention. Therefore, when there is an interest in becoming an entrepreneur, most of the values of the abilities scores are found at the top of the scale, with predominant high values.

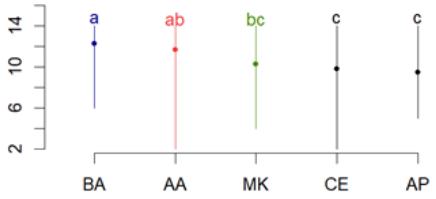
Figure 3: The statistical relationship between entrepreneurial intention and specialization



Source: Authors' contribution using RStudio software

The One-Way ANOVA analysis we have conducted to determine if the entrepreneurial intention differs depending on the specialization is exemplified in Figure 3. The illustrated boxplots denote that for all the five specializations, high values of the entrepreneurial intention score predominate. Moreover, we can say that students in the BA specialization are the most likely to become entrepreneurs, followed by AA, then MK, CE, and finally AP specialization. The Tukey HSD test shows that there are differences between the following specializations: AP vs AA, CE vs AA, BA vs AP, CE vs BA, MK vs BA (p-value < 0.05). Also, the Least Significant Difference test comes in addition by finding similarities between BA/AA, AA/MK and MK/CE/AP (Fig. 4), regarding the entrepreneurial intention.

Figure 4: Groups and range according to specialization



Source: Authors' contribution using RStudio software

The results indicate there is a similar interest in the opportunity to become entrepreneurs for students in AA and BA specializations as they tend to have more inclinations in the business field. Students in MK, CE and AP specializations present similarities regarding entrepreneurial intention because their focus is more likely to be directed towards other points of interest rather than entrepreneurship. Nevertheless, students in AA and MK specializations share a similar interest in becoming entrepreneurs since MK serves as a link between these specializations.

5. Conclusions

According to the findings of this study, most of the students surveyed have considered becoming entrepreneurs, they prove to be more proficient in cognitive skills, and the poorest in emotional abilities, while the capability to make decisions and solve problems logically and rationally, which is related to the cognitive sphere, is the most commonly regarded as a strength.

Regarding faith and the perception of spirituality, 40% of the respondents are faithful, and 34% associate spirituality with a way of thinking. In terms of demographics, female and rural respondents are more interested in becoming entrepreneurs.

Cognitive intelligence, emotional intelligence, spiritual intelligence, and creativity are significant predictors of entrepreneurial intention. Moreover, the intention to become an entrepreneur is positively influenced by the specialization of students. Therefore, the previously formulated hypotheses are validated, and thus we demonstrated the positive effect between cognitive and non-cognitive skills and entrepreneurial intention among students with economic profiles, as well as the link between entrepreneurial intention and student specialization.

Furthermore, according to the p values of the four skills, we can order them based on the intensity of their relationship with the entrepreneurial intention. Thus, the most strongly correlated with entrepreneurial intention is cognitive intelligence, followed by spiritual intelligence, emotional intelligence, and eventually creativity.

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Modeling the Cryptocurrency Market Using a VAR Approach: Analyzes, Estimates, and Predictions

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Abstract: *Blockchain technology along with virtual currencies represent a widely debated topic which in the context of the current economic climate shows a growing interest. As digitalization intensifies, it is very likely that in the future a significant part of the workforce will conduct activity in industries that use Blockchain technology. Given their novelty, Blockchain and cryptocurrencies have the potential to impact most industries and moreover to act as a link between distinct industries. Virtual currencies and the technology behind them are two extremely popular topics of the 21st century. As to how they will integrate into the current political and economic framework, researchers' views are divided. There are perspectives that suggest that these technologies will revolutionize the future, putting an end to central banking systems and traditional ways of trading. However, one fact is obvious. The emergence of these technologies seems to change the way we think and use financial resources. The paper aims to conduct an analysis regarding the interdependence between five of the most traded cryptocurrencies in terms of prices (Bitcoin, Binance, Dogecoin, Ethereum and Ripple).*

Keywords: cryptocurrencies, Granger causality, VAR, time series modeling

JEL: C22, C30, E42, E49

1. Introduction

Blockchain and cryptocurrencies are innovative technologies of the FinTech industry that have rapidly infiltrated the financial markets, shaping the power of the global economy. Cryptocurrencies represent a type of virtual currency based on cryptographic principles and benefit from decentralized management. Transaction management is provided by Blockchain technology. This refers to the existence of a distributed ledger, in which all transactions are recorded in structures called blocks, added one by one to a database and being linearly connected.

The interest in Blockchain technology has intensified in recent years, as is becoming a new foundation of transactions around the world in the age of globalization. Blockchain technology is conceptualized as a continuous, complete, distributed and unchangeable database (Yoo, 2017). Among the benefits provided by Blockchain technology are the reduction of trading costs, the elimination of third parties from the trading process, as well as the reduction of the time allocated to trading (Staples et al., 2017).

The paper aims to conduct an analysis regarding the interdependence between five of the most traded cryptocurrencies in terms of prices. The five considered digital currencies are Bitcoin, Binance, Dogecoin, Ethereum and Ripple.

2. Literature review

Beneki et al. (2019) examine the interdependence of the two most traded cryptocurrencies, namely Bitcoin and Ethereum. Their approach is driven by a VAR model and by evaluating the impulse response functions. Thus, the response of each currency to the volatility of the other currency is analyzed. Researchers point to a delayed response in the price of Bitcoin to a shock affecting Ethereum's returns.

Improving the level of digitalization in Romania in the public sector and stimulating entrepreneurs to launch various start-ups represents a challenge for the coming years in an increasing creative economy. A well-developed IT&C sector of a country will significantly contribute to reducing the costs of digitization in the current Fourth Industrial Revolution, characterized by continuous change in comparison with other countries that do not have many specialists in the field (Veith and Savin, 2019).

Yousaf and Ali (2020) analyze the interdependence between Bitcoin, Ethereum and Litecoin cryptocurrencies taking into account two important periods: the pre-pandemic period and the Covid-19 pandemic period. During the Covid-19 pandemic, in the short run, they note that Bitcoin's profitability can make a significant contribution to predicting Ethereum's profitability. An opposite situation characterizes the period before the outbreak of the pandemic, when Ethereum could serve as a benchmark in predicting the profitability of Bitcoin. A two-way relationship is reported in the pre-pandemic period for the Ethereum and Litecoin cryptocurrencies.

Blandin et al. (2020) reveal that in recent years the interest shown to cryptocurrencies has increased considerably. Specifically, they indicate an increase in the number of unique users of digital currencies by 189% in 2020 compared to 2019. The report by Exton and Doige (2018) explores the factors that determine European and American citizens to use or not virtual currencies.

Applying the questionnaire method, the research focuses on assessing the opinion of one thousand respondents in fifteen countries on the future of cryptocurrencies and their use. Their findings highlight the following aspects: many respondents (66%) are familiar with the notion of "cryptocurrency", but only 9% of the interviewed individuals stated that they own cryptocurrencies. More than a third of respondents (35%) believe that the future of online payments will be mediated by cryptocurrencies. Comparing cryptocurrencies with other investment opportunities, most respondents (65%) believe that real estate, for example, is a less risky investment option.

Liu, Rahman and Serletis (2020) analyze the spillover effect of cryptocurrency market shocks on traditional financial assets. Inducing a shock equal to a standard deviation on the profitability of cryptocurrencies does not imply a significant effect on traditional financial assets, with one exception, namely the bond market.

Hossain and Ismail (2021) indicate the existence of a significant reciprocal influence of cryptocurrencies. They identify strong, positive correlations in terms of the price movement corresponding to digital assets.

An analysis performed by Popescu et al. (2019) reveals that in Romania, the IT sector is one of the first industries to use integrated solutions. Romania is aligning to the trend that characterizes the situation at European level, that of choosing cashless payments to the detriment of cash payments. In this regard, many software providers have started to launch more and more solutions to facilitate payments between the parties (Leoveanu, 2019).

3. Research methodology

The autoregressive vector (VAR) model is an extension of the univariate autoregressive model to multivariate time series. The VAR model is a system with multiple equations in which all included variables are treated as endogenous (dependent). VAR model is one of the most widely used and flexible models for multivariate time series analysis.

In the case of a VAR model with two variables we will allow the evolution of the variable x to be influenced by previous values (lags) of x, as well as by current and previous values of y. We will also assume that y is influenced by its lags, as well as by current or previous values of x. The VAR methodology involves the structural modeling of endogenous variables in the system as a function of lags, past values, all endogenous variables in the system.

A VAR (p) model can be represented as follows:

$$Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + \cdots + A_p Y_{t-p} + BX_t + \varepsilon_t \qquad [2.1]$$

where:

Yt represents a K-dimensional vector of endogenous variables

Xt represents the D-dimensional vector of exogenous variables

A1,A2,A3…,Ap,B represents the matrix of the coefficients to be estimated

εt represents the vector of innovations. It can be contemporaneously correlated, but it does not correlate with the values corresponding to the previous periods or with the variables on the

right side of the equation.

The analysis that will performed must complete the following stages:

Step 1. Testing the time series stationarity

The development of a VAR model requires the use of stationary time series. Therefore, the ADF test will be applied to identify the unit root. If the series are concluded to be non-stationary, differentiation will be performed.

Step 2. Selecting the optimal number of lags

The optimal number of lags will be selected after running a VAR model, using Lag length criteria. Based on the Akaike, Schwartz and Hannan-Quinn criteria, the optimal number of lags will be identified.

Step 3. Estimation of the VAR model

The third stage of the research will consist in estimating the Autoregressive Vector model.

Step 4. Analysis of impulse response functions

The impulse response function (IRF) is a function that identifies the effect that a magnitude shock has on a standard deviation from the ε_t innovation on the past and present values of the variables affected by the shock. The shock response function (IRF) describes the effect of a shock administered to a variable on the future values of each variable in the system. FRS follows the trajectory of this effect over time, at different horizons. For example, the FRS can describe, in relative terms (the unit of measurement commonly being the standard deviation), the response of prices to a shock on the monetary base after a month, two months, etc. The main information provided by the IRF refers to the response sign (positive or negative) and the persistence of the effects of various shocks.

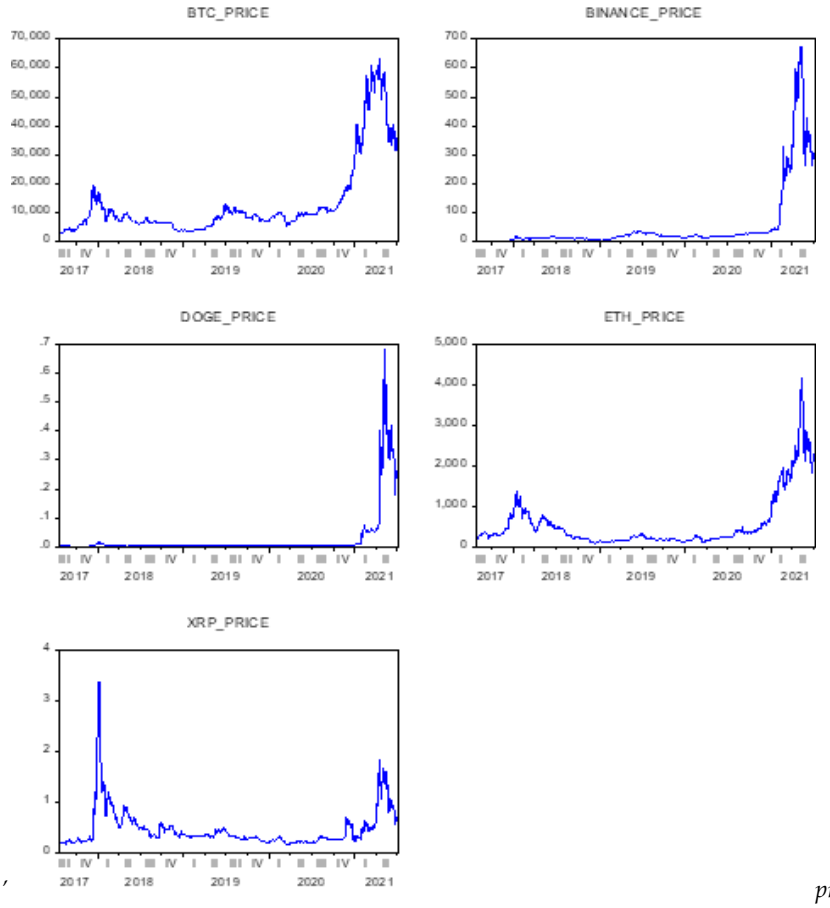
Step 5. The Granger causality test

Granger causality tests indicate which variables are useful for predicting other variables. Specifically, we can say that a variable X Granger-causes on Y if a prediction of Y based on information containing the history of X is better than a prediction that ignores the historical values of X.

Data used within this study represent the daily price recorded by five of the most traded and well-known cryptocurrencies namely: Bitcoin (BTC), Binance (BINANCE), Dogecoin (DOGE), Ethereum (ETH) and Ripple (XRP).

Thus, the analysis undertaken in this paper will be based on the use of time series collected on a daily basis, covering a time span situated between July 26th of 2017 and July 6th of 2021. The total number of observations collected is 1442, the source of data collection being represented by the https://coinmarketcap.com/ website

Figure 1: Price evolution of the five considered cryptocurrencies



Source: Authors' processings

4. Results and discussions

The previous figure shows the price evolution of the five cryptocurrencies considered in the analysis over the time span situated between July 2017 and July 2021. One can note that the prices of Binance and Dogecoin cryptocurrencies had a similar evolution. Starting with the fourth quarter of 2020 prices appreciated considerably but collapsed in the second quarter of 2021. The decline in cryptocurrency prices during this period, however, characterizes all five cryptocurrencies. Similar trends characterize the Ethereum (ETH) and Bitcoin (BTC) prices. Ripple (XRP), however, is a digital asset that has undergone a distinct evolution, so that while most cryptocurrencies have appreciated in terms of prices, XRP has reached quite low values in 2021.

The bidirectional influence of cryptocurrencies will be subject to a multivariate analysis. The first question we ask in the context of VAR modeling refers to the stationarity of the analyzed time series. Thus, we will investigate the presence of the unit root in the time series considered using the Augmented Dickey-Fuller test. The results of the stationarity test can be consulted in

the following table. Applying the stationarity test on the series at level, we note the presence of the unit root (p-values are higher than the significance threshold of 5%). Following the first-order differentiation, the time series become stationary. All five time series are first order integrated integrated I(1).

Table 1: ADF unit root test results

At level		**1st difference**	
BINANCE_PRICE	0.776	ΔBINANCE_PRICE	0.000***
BTC_PRICE	0.793	ΔBTC_PRICE	0.000***
DOGE_PRICE	0.717	ΔDOGE_PRICE	0.000***
ETH_PRICE	0.901	ΔETH_PRICE	0.000***
XRP_PRICE	0.191	ΔXRP_PRICE	0.000***

Source: Authors' processings

Once the integration order of the five variables has been determined, we will analyze their potential cointegration relationship. The concept of cointegration was first introduced by Granger (1981). It refers to the existence of a long-term relationship between the variables subject to analysis. Before determining whether the considered variables are cointegrated, it is necessary to establish an optimal number of lags that will be included in the Johansen cointegration procedure (1991, 1995). Selecting the optimal number of lags involves estimating a VAR model that includes the original time series at level, not differentiated data. The optimal number of lags specified by the Schwartz, HQ and Akaike information criteria is equal to 2, according to the results specified in the following table.

Table 2: Optimum number of lags to include

Lag	AIC	SC	HQ
0	24.685	24.703	24.703
1	24.573	24.683	24.683
2	24.524*	24.726*	24.726*

Source: Authors' processings

Following the application of the Johansen cointegration procedure, it is found that the existence of a cointegration relationship is not confirmed for the selected variables.

Table 3: Results of the Johansen Cointegration Procedure

No. of Cointegration Equations	Critical Value	Prob. **
None*	69.818	1.000
At most 1*	47.856	0.000
At most 2*	29.797	0.000

Source: Authors' processings

Given the first-order integration of the five variables, but the absence of Johansen

cointegration, the analysis will continue with the estimation of a multivariate VAR model which will contain the first-order differentiated variables. The results of the VAR model estimation is highlighted in the following figure.

Figure 2: VAR estimation results

	DBTC	DBINANCE	DETH	DXRP	DDOGE
DBTC(-1)	0.123931	0.001340	0.011527	1.69E-06	-1.53E-07
	(0.03608)	(0.00046)	(0.00252)	(2.6E-06)	(5.4E-07)
	[3.43535]	[2.91770]	[4.57082]	[0.63827]	[-0.28432]
DBTC(-2)	-0.004486	0.000178	-0.005357	2.74E-06	-1.06E-06
	(0.03619)	(0.00046)	(0.00253)	(2.7E-06)	(5.4E-07)
	[-0.12396]	[0.38747]	[-2.11740]	[1.03104]	[-1.96106]
DBINANCE(-1)	-4.255825	-0.208152	-0.536699	0.000314	-0.000166
	(2.78572)	(0.03546)	(0.19474)	(0.00020)	(4.2E-05)
	[-1.52773]	[-5.87023]	[-2.75598]	[1.53298]	[-4.00926]
DBINANCE(-2)	9.474079	0.086737	0.386250	0.000437	3.87E-05
	(2.79896)	(0.03563)	(0.19567)	(0.00021)	(4.2E-05)
	[3.38486]	[2.43455]	[1.97403]	[2.12789]	[0.92852]
DETH(-1)	-3.065403	-0.018328	-0.171207	-0.000191	-5.97E-06
	(0.58446)	(0.00744)	(0.04086)	(4.3E-05)	(8.7E-06)
	[-5.24487]	[-2.46367]	[-4.19037]	[-4.44211]	[-0.68601]
DETH(-2)	-0.268470	0.014851	0.154486	-8.12E-05	3.11E-05
	(0.58902)	(0.00750)	(0.04118)	(4.3E-05)	(8.8E-06)
	[-0.45579]	[1.98077]	[3.75181]	[-1.87681]	[3.53825]
DXRP(-1)	-575.5062	-3.753179	-51.19130	0.069469	-0.000561
	(402.258)	(5.12027)	(28.1204)	(0.02955)	(0.00599)
	[-1.43069]	[-0.73300]	[-1.82043]	[2.35108]	[-0.09361]
DXRP(-2)	489.8930	-3.475564	0.842781	0.024056	0.005358
	(401.130)	(5.10591)	(28.0416)	(0.02946)	(0.00598)
	[1.22128]	[-0.68069]	[0.03005]	[0.81643]	[0.89648]
DDOGE(-1)	3153.117	127.2379	333.0770	0.205271	-0.039238
	(1896.22)	(24.1367)	(132.558)	(0.13929)	(0.02825)
	[1.66284]	[5.27155]	[2.51268]	[1.47374]	[-1.38879]
DDOGE(-2)	1979.745	17.69223	-165.7361	0.289126	0.059306
	(1883.61)	(23.9762)	(131.677)	(0.13836)	(0.02807)
	[1.05103]	[0.73791]	[-1.25866]	[2.08967]	[2.11309]
C	21.95162	0.197873	1.386187	0.000359	0.000173
	(21.7429)	(0.27676)	(1.51997)	(0.00160)	(0.00032)
	[1.00960]	[0.71496]	[0.91199]	[0.22459]	[0.53316]

Source: Authors' processings

Based on the results provided by the VAR model, we can appreciate the mutual influence of the five analyzed cryptocurrencies. The estimated positive coefficients indicate a positive influence, while the minus sign denotes the negative impact of the exogenous variables on the endogenous variables. The equation of the model that denotes the evolution of the Bitcoin price according to its previous values taking into account two lags, as well as the prices of the other four cryptocurrencies is given below.

$$\Delta BTC_t = 0.123 * \Delta BTC_{t-1} - 0.004 * \Delta BTC_{t-2} - 4.255 * \Delta BINANCE_{t-1} + 9.474 * \Delta BINANCE_{t-2} - 3.065 * \Delta ETH_{t-1} - 0.268 * \Delta ETH_{t-2} - 575.5 * \Delta XRP_{t-1} + 489.8 * \Delta XRP_{t-2} + 3153.1 * \Delta DOGE_{t-1} + 1979.7 * \Delta DOGE_{t-2} + 21.951 + \varepsilon_{1t} \quad [3.1]$$

The price of Bitcoin at time t is positively influenced by its price in the previous period, by the price of Binance cryptocurrency at time t-2, by the price of Ripple (XRP) at time t-1, but also by the price of Dogecoin at time t-1, respectively t-2. All other coefficients denote the negative impact on the price of Bitcoin at time t.

Table 4: Granger causality test results

Null Hypothesis	**Prob.**
DBTC does not Granger cause DBINANCE	0.004
DBINANCE does not Granger cause DBTC	0.000
DDOGE does not Granger cause DBINANCE	0.000
DBINANCE does not Granger cause DDOGE	0.000
DETH does not Granger cause DBINANCE	0.101
DBINANCE does not Granger cause DETH	0.058
DXRP does not Granger cause DBINANCE	0.805
DBINANCE does not Granger cause DXRP	0.040
DDOGE does not Granger cause DBTC	0.402
DBTC does not Granger cause DDOGE	0.000
DETH does not Granger cause DBTC	0.000
DBTC does not Granger cause DETH	0.000
DXRP does not Granger cause DBTC	0.001
DBTC does not Granger cause DXRP	0.122
DETH does not Granger cause DDOGE	0.000
DDOGE does not Granger cause DETH	0.008
DXRP does not Granger cause DDOGE	0.000
DDOGE does not Granger cause DXRP	0.083
DXRP does not Granger cause DETH	0.492
DETH does not Granger cause DXRP	0.000

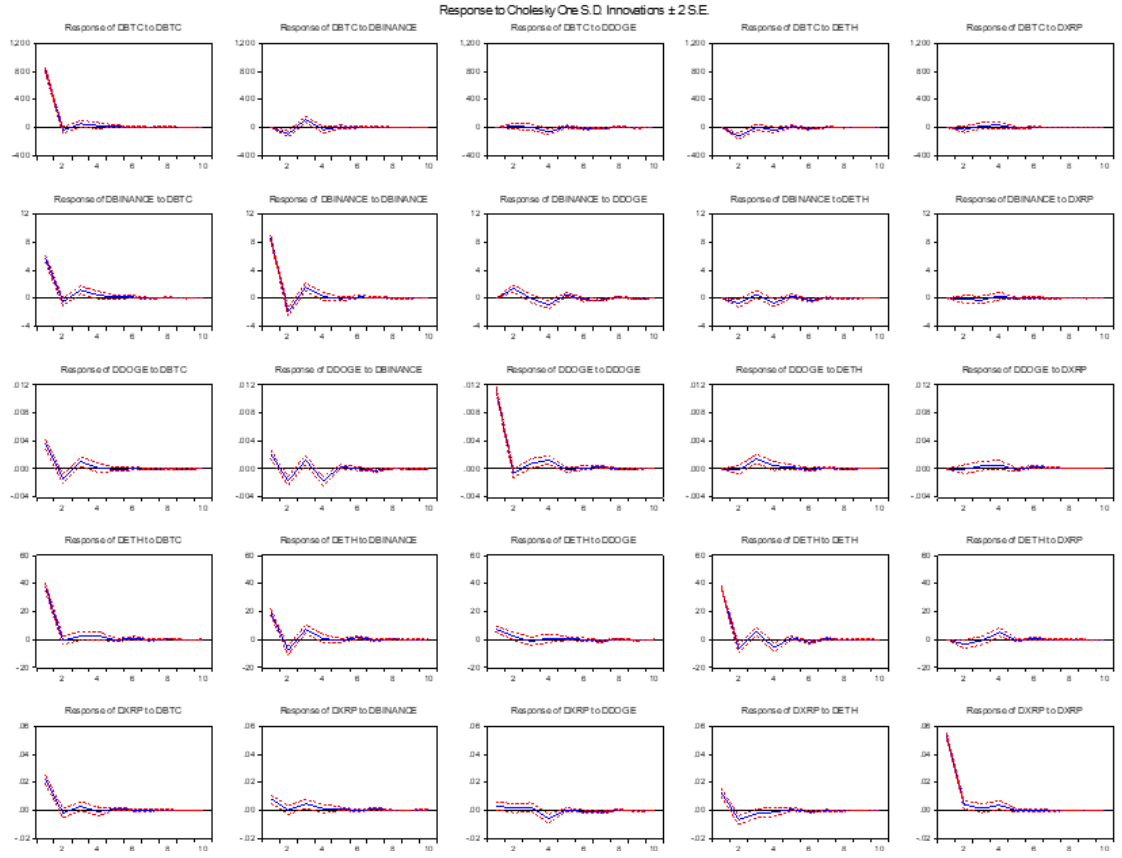
Source: Authors' processings

The causal relationship between two variables can be explored through the method proposed by Granger (1969). Granger's approach is to investigate whether a certain time series can be considered appropriate in predicting another time series. Considering the five cryptocurrencies, the causal relationship between them will be explored one by one. The null hypothesis of the absence of Granger causation is rejected for the majority of cryptocurrencies, given the values highlighted in the Prob column, below the 5% significance threshold. Bidirectional and significant causal relationships are established between the variables DBTC and DBINANCE, DDOGE and DBINANCE, DETH and DBTC, as well as between DETH and DDOGE. On the other hand, there are situations in which causality manifests itself unilaterally. This is the case with Ripple (XRP) and Bitcoin (BTC) cryptocurrencies, given that only the DXRP variable is a Granger cause of the DBTC variable.

Figure 3: Impulse-response functions associated to the five analyzed cryptocurrencies

Source: Authors' processings

Applying the vector autoregressive methodology implies an important stage, that of inter-



preting the impulse response functions, which highlight the evolution of a variable under the action of shocks induced at the level of other variables in the model. Or, in other words, they denote changes in the endogenous variable in response to an external shock. The graphs in the previous figure show the response of each digital currency to a shock produced at the level of each other analyzed cryptocurrency. The variables are expressed using the first order differentiation. Analyzing the graphs of the impulse response curves we conclude that certain cryptocurrencies do not respond significantly to shocks that affect other digital assets. One can note that the response of certain cryptocurrencies to shocks affecting other digital assets is not significant (BTC's response to XRP or DOGECOIN, BINANCE's response to XRP, or DOGECOIN's response to XRP).

However, the impulse response curves associated to DOGECOIN and ETH indicate that the price of these cryptocurrencies is more sensitive to shocks affecting the price of other digital

assets. For example, a shock induced by the DBINANCE variable implies an oscillating evolution of the DOGECOIN price over the next five periods. A similar situation is noticed when the problem of inducing a shock at the level of the DBTC variable is raised. The possible shocks in the price of the BINANCE cryptocurrency asset also affect the behavior of Ethereum coin for three consecutive periods.

5. Conclusions

Our study focused on a time horizon situated between July 26th of 2017 and July 6th of 2021, totaling 1442 daily observations which represent prices of the five cryptocurrencies. Prior to modeling the time series, it was necessary to investigate their stationarity. The results of the stationarity test indicated the presence of the unit root, an aspect that required the differentiation of the considered variables. Subsequently, the cointegration of the variables was evaluated using the Johansen cointegration procedure. No long-term relationship has been reported between the prices of the five cryptocurrencies, given the absence of cointegration. Therefore, the vector autoregressive method was chosen in order to assess the prices' interdependence of the five digital currencies. Our results indicated that the price of each cryptocurrency is influenced in a distinct manner by the price of other digital currencies. The price of Bitcoin was found to be negatively influenced by the price of Ethereum, regardless of the specified lag, given that the estimated coefficients were negative. The price of the same currency, but corresponding to the previous period, positively influences the price movement at time t, but an opposite situation is highlighted if we consider the price with a delay of two periods. Granger causality has also been studied to check if the price of each individual currency can be considered a good indicator in predicting the price of other digital currencies. Bidirectional and significant causation has been identified for Bitcoin and Binance, Dogecoin and Binance, but also for Ethereum and Bitcoin. Through impulse response curves, it has been observed that Ethereum and Dogecoin are two virtual currencies more likely to be significantly affected by potential shocks affecting the market of other cryptocurrencies.

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Problems and survival strategies for companies during the COVID-19 crisis

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Abstract: *The COVID-19 pandemic had a significant impact on the business environment, respectively the national income decreased significantly, many companies closed activity, many employees were laid off, orders fell, companies registered a deficit in cash flow, lack of supply with materials, decreased demand and cancellation of contracts. Companies have reacted differently to the COVID-19 pandemic by shutting down, making bank loans, dismissing employees, reducing employees' salaries, temporarily or completely closing the activity. The paper aims to make a radiography of the main problems encountered by companies during the COVID-19 pandemic and the short-term reactions for mitigation of shocks and survival and reorganization strategies in the post-pandemic period. In order to achieve the goals of the article, the authors used a research methodology based on the collection, analysis and synthesis of quantitative information from several secondary sources through desk research. The article shows that the impact of the pandemic was asymmetric on the business environment and companies had some common problems and differentiated responses to the crisis depending on the specifics features of the industry.*

Keywords: firms, COVID-19, survival, industry

JEL: L2, M20, D20

1. Introduction

National income decreased by an average of 4.4% in 2020 compared to 2019 in the European Union for the 27 Member States (Eurostat, 2021). Measures were imposed by the government that affected the economy, respectively international flights were blocked, borders were closed, quarantines were imposed and the activity of some companies was suspended because people were not allowed to access the physical units of the companies. Countries that had a high share of national tourism income suffered massively during the period of pandemic due to reduced international flights, low occupancy rate in hotels and related industry. Some companies were severely affected during the pandemic and were willing to cooperate with other companies even though they were competing for joint activities. Some firms have given up working with the government and have preferred to work with other firms that can provide relevant resources in a shorter time (Markovic et al., 2021).

Response speed is becoming a very important criterion in times of crisis. Companies can explore new markets and offer new products and services to survive and recover from the crisis. For example, some companies in the textile sector may manufacture protective masks, companies in the chemical sector may produce hand sanitizer, and so on. Promoting eco-tourism, cultural tourism and infrastructure investments in attractive destinations for tourists in their own country (McKinsey, n.d.). The paper aims to make a radiography of the main problems encountered by companies during the COVID-19 pandemic and the short-term reactions for mitigation of shocks and survival and reorganization strategies in the post-pandemic period.

2. Literature review

Bartik et al. (2020) conducted a research on 5,800 small businesses to assess the impact of COVID-19 on the U.S. economy and emphasiezed that 43% of the companies were temporarily closed, have reduced their average number of employees by 40%. Also, the small businesses are financially fragile, respectively the cash flow allows them another month of survival and they seek to benefit from support from government. In the U.S.A. small businesses employ about 50% of the workforce and the shock of COVID-19 on small businesses is similar in impact to the 1930 crisis (Bartik et al., 2020). Markovic et al. (2021) conducted a research on a sample of SMEs in Bosnia and Herzegovina during the pandemic of COVID-19 and found that companies in all fields of activity were negatively affected except those in the field of IT, Call centers, Consulting, Wholesale, Ecommerce and Fast moving consumer goods. Dai et al. (2021) conducted a study on a representative sample of 2278 SMEs in China and found that firms suffered significantly in terms of logistics bottlenecks, restrictions on labor mobility and reductions in order volume. The main problems faced by companies are related to: Cashflow deficit, Raw material shortage, Labor shortage, Demand reduction, Contract breach risk and Logistics block (Dai et al., 2021).

Shafi et al. (2020) conducted a survey of 184 SMEs in Pakistan during the COVID-19 pandemic and found that the main problems are related to financial issues, supply chain disruption, decrease in demand and reduction in sales and about 75% from the participating companies is expected to decrease the revenues by over 60%. Khan (2022) found that loans that were contracted

before the pandemic amplified the effect of the COVID-19 pandemic. Chinese SMEs faced financial problems and the biggest challenge for 62.3% of Chinese companies was rent payment, salary payment was a problem for 42.5% of companies, 14% said they could not survive more than a month plus 35.5% of companies that say they can survive a maximum of 3 months, ie about half of Chinese SMEs can not survive more than 3 months in lockdown conditions (Dai et al., 2021). At the company level, a system and infrastructure should be prepared to be in permanent operation and to ensure the functioning of the operational processes within the digital platform used, respectively the companies to revitalize their strategies so as to incorporate crisis scenarios for the continuation of the activity in time seeking to increase revenue from additional revenue-generating channels (Papadopoulos et al., 2020).

3. Research methodology

In order to achieve the objectives of this article, the authors used a methodology based on the collection, analysis and quantitative synthesis of information from several secondary data sources through desk research. In this regard, the authors collected various information from articles, reports and case studies available in electronic databases (e.g. Springer, Emerald, Science Direct) and libraries (e.g., the Central University Library Carol I of Bucharest).

4. Results and discussions

Based on the issues identified for companies during the COVID-19 pandemic in the literature review, there are several key issues that can be tracked. First of all, only certain sectors of activity were affected. The impact of the COVID-19 pandemic on the business environment may be grouped into 3 categories, some companies that were severely affected, some neutral companies and some companies benefited from this crisis. Shafi et al. (2020) shows that SMEs have chosen different short-term strategies to counteract the effects such as 31% of companies have completely shut down their activity, 19% of companies have partially closed their activity, 18% of companies seek to apply for a loan and 12% continue their business normally, 4% plan to change their business in accordance with the challenges of COVID-19 and 2% strive to work remotely. To address the challenges of lack of cash flow, 43% of companies surveyed chose to lay off employees, 12% prefer to reduce staff salaries and 13% plan to partially shut down to reduce costs and manage the lack of cash flow. Klyver and Nielsen (2021) conducted a study on the strategies of companies to respond to the COVID-19 crisis and made a grouping of companies that exploit the crisis (crisis exploiters), other companies that are not affected (crisis immunes) and other companies that have suffered (crisis victims) and found that firms with narrow retrenchment strategy expected decreasing turnover in 2021 while SMEs with broad strategies of perseverance and innovation expected higher revenue in 2022. If firms do not act when affected by a turbulent external environment and wait to pass the crisis on their own they will rather lose some benefits and if they persevere and innovate they will gain some benefits. Some companies have few stable suppliers due to economies of scale and at the time of blocking international transport, the supply was also blocked. The distribution of the countries that closed the borders was asymmetric with significant

delays both on the supply and production side but also on the consumer demand side and many contracts were canceled (Bartik et al., 2020). Exporting firms had more supply problems and declining orders from other countries. In different industries, respondents expect a percentage of between 30-44% to decrease their sales by more than 10% in the next period and the uncertainty regarding the reopening of the activity is correlated with anxiety, fear and worry (Dai et al., 2021).

From the exporting companies surveyed, 58.7% of the companies suffered from a lack of labor and it is 25% higher than the non-exporting companies. In China, a significant percentage of exporting companies are employed abroad and due to population restrictions this has led to a shortage of labor.

Table 1: Impact of COVID-19 on industry, reactions of firms and strategies to cope with COVID-19 crisis

Authors	Impact of COVID-19 on industry
Bartik, A. W., Bertrand, M., Cullen, Z. B., Glaeser, E. L., Luca, M. and Stanton, C. T.	• 43% of the companies were temporarily closed • 40% less employees on average
Markovic, S., Koporcic, N., Arslanagic-Kalajdzic, M., Kadic-Maglajlic, S., Bagherzadeh, M. and Islam, N.	• companies in all fields of activity were negatively affected except those in the field of IT, Call centers, Consulting, Wholesale, Ecommerce and Fast moving consumer goods
Dai, R., Feng, H., Hu, J., Jin, Q., Li, H., Wang, R., Xu, L. and Zhang, X.	• firms suffered significantly in terms of logistics bottlenecks, restrictions on labor mobility and reductions in order volume • the main problems faced by companies are related to: Cashflow deficit, Raw material shortage, Labor shortage, Demand reduction, Contract breach risk and Logistics block • the biggest challenge for 62.3% of Chinese companies was rent payment, salary payment was a problem for 42.5% of companies, 14% said they could not survive more than a month plus 35.5% of companies that say they can survive a maximum of 3 months
Shafi, M., Liu, J. and Ren, W.	• the main problems are related to financial issues, supply chain disruption, decrease in demand and reduction in • sales and about 75% from the participating companies is expected to decrease the revenues by over 60%

Authors	Reactions of firms and strategies to cope with COVID-19 crisis
Shafi, M., Liu, J., and Ren, W.	• 31% of companies have completely shut down their activity, 19% of companies have partially closed their activity, 18% of companies seek to apply for a loan and 12% continue their business normally, 4% plan to change their business in accordance with the challenges of COVID-19 and 2% strive to work remotely • 43% of companies surveyed chose to lay off employees, 12% prefer to reduce staff salaries and 13% plan to partially shut down to reduce costs and manage the lack of cash flow
Klyver, K. and Nielsen, S. L.	• firms with narrow retrenchment strategy expected decreasing turnover in 2021 while SMEs with broad strategies of perseverance and innovation expected higher revenue in 2022
Caballero-Morales, S.-O.	• a "new normal" will emerge that will require changes in business and infrastructure management in which innovation is essential for recovery and product innovation for new markets
Coronavirus' business impact: Evolving perspective | McKinsey	• 75% of the people who used digital channels for the first time say that they will continue to use them • 91% of 350 senior managers plan to maintain or increase investment in digital techn $v_{it} \sim IID(0, \sigma_v^2)$ coming years • more than half of 350 senior managers said remote work increased their productivity compared to pre-COVID-19 levels • Increasing the rate of remote work has resulted in approximately 20% savings in real estate optimization of the workspace • Collaborating on how to use an asset depending on the phase of the life cycle it is in and identifying collaborative solutions • Some employers offer parents creative flexibility regarding the timing and ways to accomplish their duties
Markovic, S., Koporcic, N., Arslanagic-Kalajdzic, M., Kadic-Maglajlic, S., Bagherzadeh, M. and Islam, N.	• Business-to-business open innovation, for example: Collaboration between some companies for the provision of protective equipment, the production of fans to treat people with COVID-19 etc.

Source: Bartik et al. (2020), Markovic et al. (2021), Dai et al. (2021), Shafi et al. (2020), Klyver & Nielsen (2021), Caballero-Morales (2021), Coronavirus' business impact: Evolving perspective | McKinsey (2021)

Collaboration with other companies is an important strategy for SMEs. An example is employee loaning or joint projects with employees in companies to fulfill their work norm in order to avoid the dismissal of employees. Some activities have constantly maintained the volume of activity or increased during the pandemic and need labor. Instead of laying off employees, some companies may work with companies that temporarily need employees. Caballero-Morales (2021) argues that after the end of the pandemic many companies will disappear and a "new normal" will emerge that will require changes in business and infrastructure management in which innovation is essential for recovery and product innovation for new markets. Papadopoulos et al. (2020) argues that there are two main schools of thought on business continuity through the use of digital technologies: in the first variant digital technologies that support processes and services are in operation and ensure continuity and in the second variant there are appropriate mechanisms that ensure business processes main and staff interactions can be performed digitally and data is stored. The implementation of modern solutions in IT depends on the ability of the entrepreneur to overcome the classic barriers that are related to lack of sufficient knowledge and lack of experience and the realization of distance communication is 46% by phone, 24% by MS Teams, Skype 9% and the rest of online communication tools account for 21% (Halina and Magdalena, 2021). Strategy and change are related concepts in business theory and represent ways to improve competitiveness in an increasing creative environment. Competent and proficient leadership is needed to meet the challenges of the 21st century and a new socio-economic strategy is required (Avny, 2015). Management's attitude towards a crisis is expressed through the activity of leaders at different hierarchical levels that influence the functioning of the organization and the process of change to achieve a strategic vision (Bolcaș and Ionescu, 2020). The study of "Digital Adoption through COVID-19 and beyond" (McKinsey, n.d.) shows that due to the COVID-19 pandemic three structural changes occurred.

A first change is in the behavior of the consumers who have started to accept and orient themselves towards the use of digital services, respectively 75% of the people who used digital channels for the first time say that they will continue to use them. A second change is for when the economy will recover, demand will be unpredictable and asymmetric at the level of regions, sectors and products and it is not known to what extent it will return to pre-pandemic levels, respectively companies will have to make certain structural adjustments of production capacity The third change is in the way companies organize their distance working models, respectively in a very short time they have managed to communicate effectively with 25-200 people immediately and to respond very quickly to customer requirements and these transformations can be an example for other companies who want to digitize their work and reorganize the company's activity. Markovic et al. (2021) conducted a study in which he found that "Procedures remain the same but these are being handled by a reduced number of staff, so everything is just slower than it used to be before. Digitalization that they use only relates to one-way communication. Digitizing companies is more of a managerial issue than a technical issue because it involves changing organizational processes within the company and training employees. The COVID-19 pandemic has affected the global economy and particularly SMEs. One of the reasons is the limited use of digital technology and especially the use of mobile payments. Digital transformation

has been studied as enablers, necessary resources and capabilities, processes and ways of transformation and benefits (Bai et al., 2021). Muhammad et al. (2021) conducted a questionnaire in which they analyzed whether companies use the Internet, e-payments, e-commerce, computers and websites to carry out their activity on finance, management, sales, production and operations in order to compare the activity of companies in Malaysia before and during the pandemic and observed the digitalization of activities in all areas. Business-to-business open innovation is a way to overcome the difficulties of the pandemic, for example Scania and Karolinska University Hospital from Sweden have collaborated to provide protective equipment that includes masks, visors and clothing. For example, Ford and GE Healthcare cooperated in production of fans to treat people with COVID-19 (Markovic et al., 2021). McKinsey conducted a study "Coronavirus' business impact: Evolving perspective" and found that 91% of 350 senior managers plan to maintain or increase investment in digital technology in the coming years and more than half said remote work increased their productivity compared to pre-COVID-19 levels and increasing the rate of remote work has resulted in approximately 20% savings in real estate optimization of the workspace. The pandemic has brought great challenges to companies and change is difficult.

There are several challenges regarding the population movement during the COVID-19 pandemic. Nasar et al. (2021) shows that in order to meet the challenges of the COVID-19 pandemic, entrepreneurs are looking for financial support, new business opportunities and credits from peers, young entrepreneurs are looking for guidance on market changes and experienced entrepreneurs are thinking of postpones its investments until after the end of the pandemic but everyone is waiting for government support through incentives, tax relief or interest-free loans.

Shafi et al. (2020) shows that companies would need government support for:

- allowing to continue the commercial activities in parallel with the security measures. This would allow the

stimulation of the economy. Even if restrictions on the movement of persons were imposed, international trade should be left open to allow for economic activity;

- home delivery of certain products and offline services. Many businesses can continue their activity without

customer contact with consumers, for example through food delivery applications. For certain services, companies may provide certain services at home to the customer but with limited contact for protection against COVID-19 such as car service;

- online payment services that allow payments without physical contact, including the payment of public utility

services to limit the number of people and limit the population.

Sustainable development involves rethinking business models in such a way that to be able to incorporate crisis scenarios, respectively to create opportunities for maintenance and attracting new customers in the digital environment (Bai, Quayson and Sarkis, 2021). Chen et al. (2021) proposed epidemic prevention and an investment-oriented control strategy and government regulation to support sustainable development.

5. Conclusions

Once the restrictions on COVID-19 are lifted the lack of demand will remain a challenge and solutions for government intervention through policies should be geared towards the demand side to support the return of SMEs. It would be interesting to follow internationally comparable data to follow in depth the evolution of the impact of COVID-19. Remote work is an opportunity for companies to counteract the effects of the COVID-19 pandemic. The digitization of work is a long-term process for companies and is an investment that will reduce the financial risk of companies in the future if similar COVID-19 crises occur.

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The link between corporate and business strategy

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Abstract: *Corporations, according to available strategy literature, have developed a distinct top-to-bottom style of communication. This has made it harder for companies to build a feasible strategic path that will result in success. We have only seen more open internal communication in the last few decades, which has resulted in an increase in efficiency. As a result, establishing the optimal strategic plan for achieving the objectives and goals requires a delicate balancing act between the corporation's and businesses' strategic objectives. The article suggests to define this same association between corporate and business strategies in order to obtain a good understanding of what needs to be done to ensure greater success. The existing literature review aided in the development of a more complete understanding of the topic, while still leaving possibilities for extra research.*

Keywords: corporate strategy, business strategy, strategy, business, strategic path

J.E.L. classification: M1, M19

1. Introduction

Since the inception of corporations, a distinct top-to-bottom communication style has been implemented. Only in the last couple of decades has top management demonstrated a willingness to listen to the needs and opinions of managers who are much closer to the day-to-day operations of the business and to understand which approach is more practical and efficient, thus establishing a new link between corporations' strategic approach and that of businesses.

In an increasing hypercompetitive business world, business organizations worldwide are trying to do their best to obtain and preserve their competitive advantage (Toma and Marinescu, 2015). In this respect, they use various tools, techniques, methods (Marinescu and Toma, 2008; Toma and Marinescu, 2017) but also different types of strategies (Toma and Marinescu, 2013). The Fourth Industrial Revolution has already had a significant impact on their business strategies and models (Toma and Tohănean, 2018). This is why innovation, learning, and entrepreneurial initiatives have become major concerns for their top management (Toma, Bratu and Burcea, 2013; Marinescu and Toma, 2017; Toma and Săseanu, 2017; Tohănean and Toma, 2018).

The purpose of this paper is to delineate the relationship between corporate and business strategies. To accomplish the above, an analysis of the last five years' worth of scholarly research was conducted in order to perceive and pinpoint the most prevalent and relevant characteristics of corporate and business strategies and typologies in order to aid in determining the optimal overall strategic path to follow. Following the review of some of the available literature on these subjects, the authors of this study propose an explanation for what this new connection between such opposing forces means, based on the most significant concepts from scholars who have conducted extensive research in this field. The authors have implemented a quantitative research approach to accomplish the article's aim. The following section discusses the literature review and research methodology, respectively. The section on results and findings encapsulates and reaffirms the study's observational findings. Lastly, the concluding section summarizes the research findings, allowing room for further analysis in a subsequent paper.

2. Literature review

i. Corporate Strategy

In the business field, the concept of strategy has derived from the military domain (Toma and Grădinaru, 2016). At its most fundamental level, corporate strategy has always been concerned with defining the business organization's mission and vision. They should be founded on a comprehensive understanding of the business's history and identity, as well as its unique culture, values, but also capabilities, as well as the overall ambitions and objectives of the corporation's key stakeholders (Toma, Marinescu and Constantin, 2016). While the mission articulates the organization's purpose, the vision articulates a desired future state(Toma,Marinescu and Grădinaru, 2016). A compelling corporate vision is much more than a summary of the status quo. It is an audacious goal grounded in the company's existing resources and competencies. It should be feasible and act as a guide for subsequent strategic choices. It should be written in a

straightforward and simple manner that makes straightforward to determine whether the vision has been realized. Organisational vision must always be translated in to the corporate portfolio as well as growth strategies at the second level. Corporate strategy is centred on portfolio strategy. It defines the portfolio composition of the desired portfolio and the path to achieve it. Additionally, it establishes the portfolio's overall logic and distinguishes the different duties that the companies are expected to play within the portfolio. Corporate growth strategy focuses on the component of portfolio strategy only with greatest potential for long-term value creation. Corporate growth strategy has been generally treated as a distinct element during the development of corporate strategy, as it may entail the hunt for new growth opportunities outside of the existing portfolio. On the other hand, the final growth strategy should be mirrored in the destination portfolio and the corporate portfolio strategy as a whole (Pidun, 2019).

Other authorsprovide another perspective on the definition of corporate strategy. Corporate strategy, they believe, define the company's future development. Its corporate strategy enables it to address the following questions: diversification, integration, and acquisition of new businesses (Aliekperov, 2021).As such, we can see that corporate strategies serve as a framework for the development of lower-level strategies. The team at this level determines where the entity will compete, how resources are deployed, and how the organization's business portfolio could be bolstered, among other things(Heath and Johansen,2018).In addition, corporate scope decisions including mergers and acquisitions, collaborations, and divestments have the opportunity to generate or dismantle vast quantities of value for shareholders, to greatly affect operating efficiency for the better or worse, and to impose significant organizational repercussions on businesses. As such, these types of decisions frequently become focal points of discussion during meetings of the top-level management and in corporate boardrooms. Discrepancies in firm performance are critical to corporate strategy because they serve as a result — preferably, the decisions made by a firm's manager in rebuttal to the aforementioned questions result in the firm outperforming its competitors (Feldman, 2020).

ii. Business Strategy

There is no one-size-fits-all strategy for a manager. There is no prescription since there is no one-size-fits-all strategy or method for developing strategy. Strategy is situational. It is created in response to individual business challenges and constraints within the organization. Organizations face particular challenges and limitations. Any strategy theory that is not contextualized is of little use to a strategic manager. A strategy is a plan of action chosen by an organization to address specific problems, either both now and in the future. All strategy is context-dependent. Diverse situations necessitate distinct strategies. Neither the content nor the procedures of strategy are context insensitive. Theoretical frameworks for strategy can only serve as a backdrop for context-specific strategies. Additionally, there is the perception issue. If the objective of strategy is to resolve current or future organizational problems, the strategist's perception of the problem is critical. Issues are not perceived solely through analysis. Given the same assessment, two decision makers may have diametrically opposed perceptions of the problem and, consequently, two

diametrically opposed plans of action. No amount of analysis will help. Perception is influenced by a variety of factors, including the strategic manager's character, fears, and aspirations. The strategist acts in accordance with his perceived notion of the situation, not with reality. Reality is impenetrable. In this context, strategy theories' emphasis on increased and improved analysis for strategy formulation may be misplaced. If strategy is a matter of perception, no amount of new analysis will contribute to enhance the strategic decision. Strategy hypotheses are too fixated on analysis to recognize that reality, particularly in the case of organizations, is perceptual. A more qualitative approach will aid in the comprehension of strategy formulation(Iruthayasamy, 2021).

Through a review of the available literature on business strategy, one could identify three distinct schools of thought regarding strategy. The 'planning' school ensures that the organization's strategy is compatible with the environment throughout which it operates. It necessitates meticulous and inflexible planning, which is incompatible with turbulent markets. Additionally, it makes use of the 'Product Life Cycle' as well as other marketing concepts. This school of thought is founded on historical trends, forecasts, and reliable frameworks and environments, and is highly bureaucratic and rational in its approach. Ansoff is among the most notable figures associated with this school of thought. He has created a matrix that enables people to visualize the relationship between products and markets and to plan accordingly. On the other hand, the 'positional' school emphasizes a sensible, analytical approach to strategy development and seeks to position the organization and its commodities in a favourable market or environment. This school of thought emphasizes competitive advantage through performance appraisal and decision-making tools. Finally, the 'resource-based' school is concerned with the internal environment rather than the external environment. It is centred on an 'inside-out' approach, implying that an organization's competitive advantage is derived from its own unique resources, capabilities, and competences. However, there is a risk in this last case of overlooking the external environment (Ritson, 2019).

iii. Aligning Corporate and Business Strategy

Alignment has traditionally been approached in strategic management from two points of view: external and internal alignments. External alignment refers to the alignment of an organization's strategy, competencies, and so on, with its environment. This is occasionally referred to as "fit." Internal alignment refers to the alignment of organizational factors within the organization, such as processes and approaches or strategy and objectives. Internal alignment is classified as vertical or horizontal in research. Vertical alignment is synonymous with aligning strategy elements such as goals and activities across hierarchy levels. Horizontal alignment aligns these elements horizontally across units and functions. Corporate and business strategic planning alignment is critical to the competitiveness and performance of multi-business firms. To fully grasp what alignment for both business and corporate strategy entails, the findings suggest that the link between the two also requires definition. To help convey the meaning of this relationship, the term "alignment relationship" is coined. Two distinct types of alignment connections have been identified in previous study: numerical and non-numerical. Numerical relationships are defined by the ability to mathematically accumulate or decompose components of strategies into a widespread sum, difference, quotient, or product. There is no such numerical rationale in a

non-numerical alignment link. Alignment with such a mathematical relation is readily apparent; alignment with non-numerical ties is more challenging to detect (Wadström, 2018)

It is not unusual for an organization to have conflicting strategic objectives, as the self-interests of individual managers, corporate executives, and business owners may differ from the defined corporate goals. The concept of "moral hazard" refers to a pervasive agency problem that has been extensively discussed in management literature. It describes a situation whereby an agent abdicates his agreed responsibilities due to a conflicting self-interest with that of the principal, and the principal would be unable to ascertain if the agent is going to act in accordance with the agreement or not. In a target conflict, the collaborating parties' divergent interests result in costs and inefficiency, which are incurred by various stakeholder groups. Entrepreneurial businesses work and compete in an ever-changing, disruptive environment. Information critical to corporate visions is frequently asymmetrical and, at times, commoditized at a high cost to the agency. The dichotomy of values and objectives has become pervasive in corporate organizations, exacerbated agency problems, and frequently resulted in unrealized growth potentials. The effectiveness of strategy implementation in a corporation is contingent not only onthe entrepreneurial spirit, leadership, strategy implementation, and resource orchestration but also on the characteristics and unpredictability of the operating environment, as well as the pervasive culture of goal congruity, which are traditionally unpredictable to the organization (Omotosho and Anyigba, 2019).

Strategic controls play a critical role in corporations by monitoring the interrelationships between various business units and ensuring that the scale economies anticipated from efficiency gains between core businesses are realized. However, such interrelationships frequently have an effect on the short-term financial management of business units. By implementing strategic controls, corporations can incorporate the strategic impact of business unit activities into their performance assessment and reassure business unit executives that any subsequent lower financial results may be justified by the strategic outcome of risky decisions such as research and development investment. Strategic controls are frequently embodied in organizations through regular interactions between both the company business manager as well as corporate staff to ensure that corporate headquarters understands the business unit's decisions. The efficiency of a business unit is determined not only by its strategic orientation, but also by the "fit" of various organizational variables that can impact that business unit's results. The concept of "fit," which originated in cognitive and behavioural organization studies, was also used to describe the connection between firm controls and microlevel business unit practices. Such arguments imply that in order to support business unit effectiveness and deliver superior performance, micro-level practices must adhere to the macro-level control requirements. Previous research has discovered that a fit among both business unit strategy and internal organization of the corporation has an effect on business unit performance, with greater autonomy resulting in higher market performance and less autonomy resulting in increased short-term financial performance (Seifzadeh and Rowe, 2019).

3. Research methodology

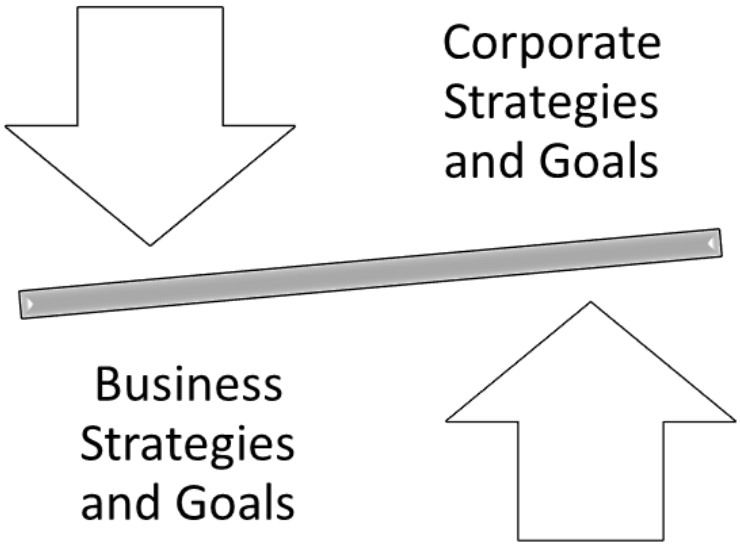
An empirical quantitative study was used in this article, which involved the collection and examination of secondary information about the development of a variety of corporate and business strategy concepts, which could then be utilised to inform the study's design. Following that, the authors conducted a review of the literature and discussed their findings.

4. Results and discussions

After reviewing some of the available research on business and corporate strategy, the authors noted that there is a clear need for alignment between the two at both the macro and micro levels. For this alignment to be successful, there must be a strong connection between lower management's strategic goals and those of upper management in order to accomplish the company's overall goal. If this connection is not maintained, a breakdown in communication or a deviation in the tactics chosen could potentially disrupt the overall strategic path and result in inefficiencies in the corporation's overall performance.

The authors envisioned the corporate strategic approach and the business approach as two polar opposites that balance one another (Fig 1). The fine line that keeps these strategies in check is the strategic path that connects them to the company's overall goals.

Figure 1: The strategic balance



Source: Author's own contribution based on literature review analysis

If one pushes the other more than is prudent or attempts to overwhelm the other with additional tactics and decisions, an imbalance is created, the path is disrupted, and a portion of the

overall goal is jeopardized. As such, maintaining this path should be the primary objective in this instance.

5. Conclusions

The purpose of this article was to establish a connection between corporate and business strategies. To achieve this, it was essential to develop a better comprehension of what the concepts of corporate strategy as well as business strategy mean in today's business environment and how to best align them in establishing a well-defined strategic path needed to reach the company's overall objective. The authors proposed an explanation for the nature of the connection between such strategic approaches following a thorough review of the literature. As a consequence, the paper highlights the crucial nature of maintaining equilibrium in order for their strategic paths to align. This confirmed to be a viable direction for the paper, and it paves the way for future research in subsequent papers.

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ONLINE EDUCATION CHALLENGES IN THE NEW ERA OF GLOBALIZATION

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Abstract*: The modern society is in a continuous development, thus governed by globalization and digitalization, those two concepts becoming ubiquitous among each of us. Once the technological evolution and the pandemic caused by the COVID-19 virus had happened, each domain of activity tended to approach dome kind of digitalization. This article aims to present the challenges that took place in the educational system once the online education took place over the traditional technique of learning and teaching. Even thought, the online education started from some time ago, once the pandemic struck, all the states on the globe, despite of the economic situation or capabilities, had to implement any kind of online education in order to maintain the evolution and development of the youth, especially. Therefore, within this article it's going to be analyzed the impact of adopting this method of e-learning, the challenges and the changes that appeared in 2020 on the scholar population from 27 states of European Union.*

Keywords: online education, globalization, challenges, impact, evolution, European Union

JEL: C38, C46, I21, I24, I25, O11, O12.

1. Introduction

Globalization has two fundamental directional tendencies, more precisely: expanding of global connectedness and increasing of global consciousness. Moreover, nation-states, world politics, individuals, and humanity are the four points of reference for globalization Digital economy, e-commerce, and digitalization may be seen as effects of globalization, characterized by incessant change. According to Veith and Savin (2019) this concept represents an ecosystem who transforms the main value chains and made it possible to satisfy all the demands of the customers.

In Romania, the evolution of the educational system has been touched by the continuous changes in the political and administrative systems, as well as the technological evolution and the changes in the user's behaviors. Thereby we can look at the educational system at it as a cybernetic system influenced by the environment in which all its activities are carried out. Moreover, we can't analyze and diagnose this complex adaptive system without taking account of the impact produced by the politic, technological, social, economic, legal, and ethical factors.

The technological evolution, globalization and the advent of computers took place rapidly in the current Fourth Industrial Revolution, so the society had to adapt quickly on the necessity of learning how to operate those entirely new machines. The increasing necessity made all the educational institutions introduce in teaching disciplines more and more classes based on informatics and coding programs.

Currently, to maintain the competitiveness at a global level, the educational institutions embody major use of communication and information technologies in the curriculum, in order to provide the pupils many options of online learning. Withal, many educational institutions choose to deploy a blended learning approach on this event, based on combining the traditional way of teaching and learning where the entire lecture is explained by a teacher using online resources. This kind of approach is very popular because it offers pupils the opportunity of learning faster through a very wide range of resources. As the pressure of offering more e-learning options continuously increases it is much more important to consider pupil's and student's attitude and opinion on the fact of switching from the traditional way to the online teaching methods. According to Moldovan et al. (2011), education has always been a preoccupation of the governments all over the world even though the systems differ from a country to another.

The COVID-19 pandemic represents a very important event that didn't influenced only the economic environment, but it influenced citizens and their normal life (Veith and Dogaru, 2020). This pandemic caused a very interesting change for the educational institutions especially. Even though e-learning was a very well-known practice for some of them, many others had a very hard time. But, in order to protect the human life and the access to education it was necessary to issue quick strategic decisions so that the traditional learning and teaching method to be switched in online. These changes had a significant impact on education, pupils, students, teachers, researchers and for the governmental, microeconomic, and macroeconomic sector. This article aims to present the challenges that took place in the educational system once the online education took place over the traditional technique of learning and teaching.

2. Literature review

According to Stewart (1996), globalization refers to the gradual broadening and strengthening of global ties that began after World War II and have now reached a point where almost no one is completely unaffected by events occurring outside their own country, and where international constraints are increasingly limiting independent national action. Many facets of development and policy are influenced by globalization. One of the most important implications of globalization at the moment is represented by the topic of this article, meaning the education, precisely the online education or e-learning.

The educational system as well as the teaching and learning methods are affected by the globalization and the expansion of creative economy. Since the Sars-Cov-2 virus has impinging worldwide, every country must fight to defeat the pandemic, but until this will happen every country have to maintain all the activities on a waterline.

The education sector in Europe and Central Asia has been as affected as in the other continents because of the COVID-19 epidemic, yet on these continents has been occurred closures of school in twenty nations and closures of pre-school in nineteen countries. This impacted a total of 49.8 million students, ranging in age from pre-kindergarten to upper secondary school, who had an extremely interrupted last school term. The epidemic has worsened the region's existing educational and social disparities. Children from poor families, children from rural areas with lower infrastructure, children from ethno-linguistic minorities, disabled children, foreigner and immigrant children, children in conflict with law, out-of-school adolescents, and boys and girls otherwise faced by poor circumstances or violent homes faced significant barriers to full participation in learning and education and experienced lower education and social opportunities. Schools are a place for social and emotional development, social engagement, and social support in addition to academic learning. Children's learning has been disrupted, as has access to school meals, well-being support, and referrals to essential health and social services. Teachers, school administrators, school personnel, and decision-makers at the national and regional level have a huge challenge. Failure to meet this challenge would have long-term social and economic consequences for children, teenagers, families, regions, and societies. (United Nations Children's Fund (UNICEF), 2020)

The pandemic has accelerated a global trend, very well-known now, meaning the online education or e-learning. This kind of education is defined by Joshua Stern as the education that happens over the Internet, not in a classroom, yet wherever you are because it's a distance learning method. This technique is based on virtual classrooms and classes where every activity is scheduled and announced and where the pupil or students can interact with their teachers, write on a whiteboard, access every educational resource, chat with his classmates and teachers, send assignments, take tests and quizzes, or consult the gradebook.

Currently, according to Toader et al. (2021) online education presents strengths and opportunities as well as weaknesses and threats. From the perspective of the strengths and opportunities, online education promotes a very flexible program, a very easy access to resources, quick feedback, monetary savings, lasting acclimatization to new circumstances, re-evaluation of certain skills, emphasis on pedagogical abilities and creates time management and organizational skills. From the perspective of the weaknesses and threats, online education promotes more

time spent in front of technological devices, a smaller visible communication between professors and pupils, dependence on Internet signal, electricity, and the quality of the equipment used for Internet connection. As an overall result of using the online education, the lesser developed countries, as Romania is, have been extremely affected from the economic point of view. Moreover, weak interaction between pupils, students, and teachers, less students and pupils with access to Internet or a computer, early leavers, and limited digital competences of the students as well as the teachers or parents, will evolve in a few generations of unprepared, undeveloped and introvert working class.

3. Research methodology

Scientific knowledge in any sphere of human activity requires a comprehensive and careful quantitative study of the phenomena that are the subject of the inquiry, independent of the nature and complexity of the actual aims pursued.

In order to present the impact of adopting the online education instead of keeping the traditional education in the less developed countries like Romania, it will be used 27 observations which represents the 27 sates of the European Union, including Romania, in 2020. Using the datasets provided by Eurostat, I have previously processed the 27 states and the 5 indicators using Microsoft Excel and then I have used RStudio to analyze them (Appendix 1).

The first indicator is EL or Early leavers from education and training by sex which measures the proportion of people aged 18 to 24 with a minimum of a lower secondary education who did not participate in any type of education or training in the four weeks leading up to the poll.

The second indicator is TEA or Tertiary educational attainment by sex which measures the proportion of people aged 25 to 34 who have finished tertiary education, such as university, higher technical institution, master's degree, etc.

The third indicator is YPEE or Young people neither in employment nor in education and training which measures the proportion of people aged 15 to 24 who are unemployed or inactive and who have not received any education and training in the four weeks prior the survey.

The fourth indicator is APL or Adult participation in learning by sex which measures the percentage of adults aged 25 to 64 who said they had formal or non-formal education or training in the four weeks before the poll.

The fifth indicator is ERRG or Employment rates of recent graduates which measures the employment rates of people aged 24 to 34 who are employed, who completed at least upper secondary education and who did not receive an education or training in the four weeks prior to the survey.

The most appropriate tools for identifying causal structures, detecting certain trends and configurations on the set of investigated data, and obtaining simplified representations of very complicated information are data analysis methods and procedures. For this study, it will be presented the technique of descriptive statistics and the analysis of the main components.

Descriptive statistic is a method included in the preliminary analysis of the data and are used to provide details about the distributions of the variables. Measures of central tendency like mean, median and mode, measures of fluctuation around the mean like standard deviation and

variance, measures of deviation from normality like skewness and kurtosis, information about the dispersion of the distribution like the maximum value, minimum value and range, and information about the consistency or measurement errors. (George and Mallery, 2016)

According to Ruxanda (2013) the principal component analysis is a multidimensional analysis approach that seeks to find new variables, called principal components, that are described as linear combinations of the original set of variables and have the most variability. The main components are abstract vector factors involved that are defined as linear combinations of the original data and have two fundamental properties: they are mutually independent two by two, and the sum of the squares of the coefficients that describe the linear combination relating to a main component equals the unit and the first main component is a standardized linear combination with the maximum variant, and the second main component is a line.

The primary components have a variety of fascinating qualities that stem from their description and are crucial to comprehending their nature and substance. One feature is that each primary component's variance is maximal and equal to its own covariance matrix value. The primary component's second quality is that they are uncorrelated two by two.

4. Results and discussions

The first analysis is the descriptive statistics method which shows the five indicators previously explained and the mean, standard deviation, median, minimum value, maximum value, range, skewness, and kurtosis. As we can see, Romania has the following values for the indicators: 15.6% for EL, 24.9% for TEA, 14.8% for YPEE, 1% for APL and 76.7% for ERRG (Appendix 2).

The EL indicator has the maximum level of 16% and the minimum level of 2.2%. This means that Romania has many early leavers from the education and training programs while using the online education. The mean of this indicator is 8.64% and the median is 8.1% which shows that the small numbers of early leavers is possible in countries that have the capabilities of implementing a very good online education method.

The TEA indicator has the maximum level of 60.6% and the minimum level of 24.9%. This means that Romania has the smallest tertiary educational attainment of all the countries.

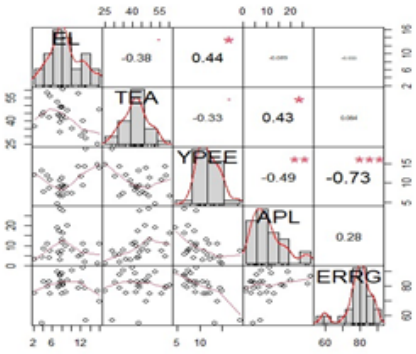
The YPEE indicator has the maximum level of 19.0% and the minimum level of 4.5%. This means that Romania has many young people neither in employment nor in education and training, but it is not classified as the most affected country in this situation.

The APL indicator has the maximum level of 28.6% and the minimum level of 1%. This shows that Romania has the least number of adults participation in learning.

The ERRG indicator has the maximum level of 92% and the minimum level of 54.9%. The mean of this indicator is 79.51% and the median is 80.55% which shows that even though Romania has the smallest tertiary educational attainment, the employment rates of recent graduate classify this country on an increasing trend.

Before using the principal components analysis, I decided to calculate the correlation matrix.

Figure 1: Correlation matrix



Source: Authors' own research results

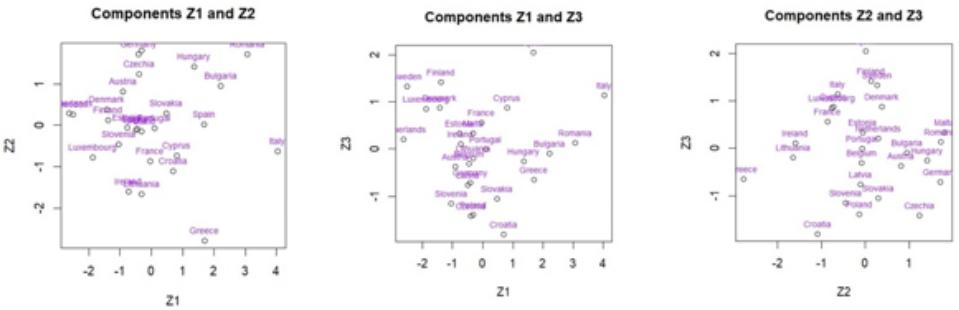
As we can see analyzing the first figure, on the right side it is showed the correlation between the indicators. The EL indicator and the YPEE indicator are strongly correlated (0.44), which explains that the great number of young people neither in employment nor in education is based on the early leavers who prefer to choose other activities than learning or evolving themselves in the economic sector. The second strong positive correlation is between TEA and APL (0.43), which shows that adults included in the APL analysis and TEA just finished their tertiary education. The third strong, but negative correlation is between YPEE and ERRG (-0.73).

The second analysis is the principal components analysis, and the first step is represented by the selection of the principal component's number which were chosen using three criteria: Kaiser, Slope or Scree Plot and Variation Percentage (Appendix 3).

As we can see, there are three principal components. The first one has the YPEE indicator, and we will refer to it as young people neither in employment nor in education and training. The second one has the EL and ERRG indicators, and we will refer to it as early leavers and employment rates.

The third one has the APL indicators, and we will refer to it as adult participation in learning.

Figure 2: Components plots



Source: Authors' own research results

Analyzing the second figure we can see the bonds between the observations and the principal components. In the first case, Romania presents almost the stronger direct correlation with the young people neither in employment nor in education and training component and the early leavers and employment rates component, which means that Romania is almost the last country in this top because of the higher values registered. In the second case, Romania presents a strong direct correlation as well with the young people neither in employment nor in education and training component and the adult participation in learning component, which shows that adults are more interested in learning than the younger generation. The third case shows that Romania is weakly correlated with the early leavers and employment rates component and the adult participation in learning component, which means that younger generation is becoming more uninterested in learning even though the online education is more innovative.

5. Conclusions

In conclusion, Romania in the era of globalization, digitalization, and online education experience major drawbacks, which shows that neither the society, nor the educational system is prepared for this event. Thereby, Romania needs to show more interest in investing in the online learning platforms and educational system. Moreover, Romania must invest more time in order to improve the recruitment rate of the younger generation especially. Without raising the interest of the younger generation in education Romania will experience a very unpleasant event like uneducated population, undeveloped education, and unprepared society for working sector.

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Appendix 1

Table 1: Original data base

COUNTRY	EL	TEA	YPEE	APL	ERRG
Belgium	8.1	48.5	9.2	7.4	82.9
Bulgaria	12.8	33.0	14.4	1.6	78.7
Czechia	7.6	33.0	6.6	5.5	87.3
Denmark	9.3	47.1	7.4	20.0	83.6
Germany	10.1	35.1	7.3	7.7	90.5
Estonia	7.5	43.1	8.9	17.1	79.8
Ireland	5.0	58.4	12.0	11.0	79.5
Greece	3.8	43.7	13.2	4.1	54.9
Spain	16.0	47.4	13.9	11.0	69.6
France	8.0	49.4	11.4	13.0	74.9
Croatia	2.2	36.6	12.2	3.2	75.2
Italy	13.1	28.9	19.0	7.2	56.8
Cyprus	11.5	57.8	14.4	4.7	78.6
Latvia	7.2	44.2	7.1	6.6	79.1
Lithuania	5.6	56.2	10.8	7.2	74.5
Luxembourg	8.2	60.6	6.6	16.3	80.5
Hungary	12.1	30.7	11.7	5.1	82.2
Malta	12.6	40.1	9.3	11.0	92.0
Netherlands	7.0	52.3	4.5	18.8	89.3
Austria	8.1	41.4	8.0	11.7	88.4
Poland	5.4	42.4	8.6	3.7	82.7
Portugal	8.9	41.9	9.1	10.0	75.7
Romania	15.6	24.9	14.8	1.0	76.7
Slovenia	4.1	45.4	7.7	8.4	82.8
Slovakia	7.6	39.0	10.7	2.8	82.8
Finland	8.2	43.8	9.3	27.3	81.5
Sweden	7.7	49.2	6.5	28.6	86.4

Source: Data provided by Eurostat

```
getwd()
setwd("C:/Users/TheBlondeSalad/Desktop")
library(readxl)
date<- read_excel("data.xlsx")
date
d<-date[,2:6]
View(d)
summary(d)
library(psych)
describe(d)
install.packages("corrplot")
library(corrplot)
corelation<-cor(d)
corelation
corrplot(corelation, method='number', type="upper")
library(ggplot2)
ggplot(date,aes(x=EL,y=TEA))+ geom_point(shape=16,size=4,col="red")+geom_text(label=date$COUNTRY,vjust=0,hjust=0,size=4)
ggplot(date,aes(x=TEA,y=YPEE))+ geom_point(shape=16,size=4,col="red")+geom_text(labe
```

```
l=date$COUNTRY,vjust=0,hjust=0,size=4)
    ggplot(date,aes(x=YPEE,y=APL))+  geom_point(shape=16,size=4,col="red")+geom_text(labe
l=date$COUNTRY,vjust=0,hjust=0,size=4)
    ggplot(date,aes(x=APL,y=ERRG))+  geom_point(shape=16,size=4,col="red")+geom_text(lab
el=date$COUNTRY,vjust=0,hjust=0,size=4)
    library(PerformanceAnalytics)
    chart.Correlation(d,histogram=TRUE,pch=19)
    date_std=scale(date[,2:6],scale=TRUE)
    View(date_std)
    date_std
    observation_name=date[1]
    observation_name
    pca=princomp(date_std, cor=TRUE)
    pca
    sdev=pca$sdev
    valprop=sdev*sdev
    procentA=valprop*100/5
    procentC=cumsum(procentA)
    V=zapsmall(data.frame(valprop,procentA,procentC))
    V
    valprop
    scree_plot=prcomp(date_std)
    plot(scree_plot,type="l",main="Scree_plot",col="pink")
    abline(v=3.5)
    c=zapsmall(pca$loadings)
    c
    write.table(zapsmall(pca$loadings),"prop.vectors.txt")
    e=eigen(cov(date_std))
    e$values
    e$vectors
    d=zapsmall(pca$scores[,1:3])
    d2=cbind(d,observation_name)
    d2
    date_std
    corFact = zapsmall(cor(date_std,d[,1:3]))
    corFact
    colnames(corFact)=c("Z1","Z2","Z3")
    library(corrplot)
    corrplot(corFact,method="circle")
    cerc = seq(0,2*pi,length=100)
    plot(cos(cerc),sin(cerc),type="l",col="pink",xlab="Z1",ylab="Z2")
```

```
text(corFact[,1],corFact[,2],rownames(corFact),col="red",cex=0.7)
abline(v=0)
abline(h=0)
cerc = seq(0,2*pi,length=100)
plot(cos(cerc),sin(cerc),type="l",col="pink",xlab="Z1",ylab="Z3")
text(corFact[,1],corFact[,3],rownames(corFact),col="red",cex=0.7)
abline(v=0)
abline(h=0)
plot(d2[,1],d2[,2],main="Components Z1 and Z2",xlab="Z1",ylab="Z2")
text(d2[,1],d2[,2],labels=d2[,4],col="purple",pos=3,cex=0.7)
plot(d2[,2],d2[,3],main="Components Z2 and Z3",xlab="Z2",ylab="Z3")
text(d2[,2],d2[,3],labels=d2[,4],col="purple",pos=3,cex=0.7)
plot(d2[,1],d2[,3],main="Components Z1 and Z3",xlab="Z1",ylab="Z3")
text(d2[,1],d2[,3],labels=d2[,4],col="purple",pos=3,cex=0.7)
df=data.frame(d2)
biplot(df[,1:2], pca$loadings[,1:2], cex=c(0.7,0.8))
biplot(df[,2:3], pca$loadings[,2:3], cex=c(0.7,0.8))
```

Appendix 2

Table 2: Descriptive statistics

	vars	n	mean	sd	median	trimmed	mad	min	max	range	skew	kurtosis	se
EL	1	27	8.64	3.44	8.1	8.51	2.97	2.2	16.0	13.8	0.39	-0.48	0.66
TEA	2	27	43.49	9.17	43.7	43.53	8.15	24.9	60.6	35.7	-0.02	-0.71	1.76
YPEE	3	27	10.17	3.31	9.3	9.99	3.26	4.5	19.0	14.5	0.62	-0.13	0.64
APL	4	27	10.07	7.25	7.7	9.28	5.34	1.0	28.6	27.6	1.04	0.32	1.39
ERRG	5	27	79.51	8.64	80.5	80.55	5.63	54.9	92.0	37.1	-1.27	1.69	1.66

Source: Authors' own research results

Appendix 3

Table 3: Kaiser criteria

```
Call:
princomp(x = date_std, cor = TRUE)

Standard deviations:
   Comp.1    Comp.2    Comp.3    Comp.4    Comp.5
1.5418369 1.0756843 0.9364467 0.6755993 0.3636965

 5  variables and  27 observations.
```

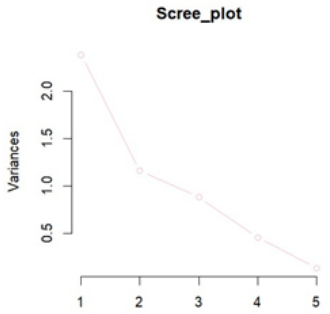
Source: Authors' own research results

Table 4: Slope criteria

	valprop	procentA	procentC
Comp.1	2.37726	47.54522	47.54522
Comp.2	1.15710	23.14194	70.68716
Comp.3	0.87693	17.53865	88.22581
Comp.4	0.45643	9.12869	97.35450
Comp.5	0.13228	2.64550	100.00000

Source: Authors' own research results

Figure 2: Scree plot



Source: Authors' own research results

VOLUNTEERING - FROM PARTICULAR TO UNIVERSAL

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Abstract: *Nowadays, volunteering is a visible phenomenon in all countries, manifesting in varying degrees of development. The pandemic situation which started in 2020, highlighted the fact that regardless of culture, religion or geographical area, people have mobilized and reacted similarly to manage the crisis, realizing the necessity for solidarity and social cohesion. Volunteering is a complex, multidimensional concept, and the activities conducted at individual or organizational level represents a suitable response to environmental, economic, social, educational, cultural, or health challenges in the context of a dynamic and constantly changing society. The aim of this research was to discover new meanings of volunteering, taking into consideration the importance, particularity, universality, and the mobilizing values of this activity, which have materialized in the form of a new definition. Volunteering is one of the factors that contributes to the personal development of individuals, by increasing self-esteem and self-confidence, as well as the development of solidarity between generations, stimulation of active citizenship and social change.*

Keywords: volunteering, socially responsible behavior, social inclusion, social change, active citizenship, globalization

J.E.L. Classification: A130, L310, Y9

1. Introduction

Volunteering is a complex phenomenon that has drawn the attention of a large number of academic representatives, private and public organizations, as well as civil society. The degree of individuals involvement in volunteering activities varies from one country to another, depending on certain factors such as: material living conditions, values, religion and education (Butcher and Einolf, 2017).

Throughout history, volunteering has manifested in various forms, and it has been associated with multiple practices and experiences, but his presence was felt more significantly after the First World War, on the one hand as a response to the war horrors, and on the other hand, as an alternative to compulsory military service. The German sociologist and historian Eugen Rosenstock-Huessy, who supported the creation of the Voluntary Peace Service, is considered as the spiritual father of volunteering.

The Covid-19 pandemic which started in 2020, highlighted the fact that regardless of culture, religion or geographical area, people have mobilized and reacted similarly to manage the crisis, realizing the necessity for solidarity and social cohesion (Ganta, 2020). At the same time, it was emphasized that volunteering represents one of the ways in which people help each other in difficult situations, contributes to the interconnection of relevant actors from the civil society, private and public sectors, increase awareness and solving problems in the community (United Nations, 2021).

This paper presents an analysis of the volunteering specialized literature and explores the universal dimension of this concept. The result of this research was materialized in a new definition that includes the universal and spiritual side of volunteering, which contributes to the literature enrichment.

2. Literature review

Volunteering

In the specialized literature there is no consensus regarding an unanimously accepted definition of volunteering, as researchers have differing views on the limits, factors and nature of this concept, and continue to identify new links with other concepts such as social responsibility (Toma, Stanciu and Irimia, 2011; Toma, 2013) or social entrepreneurship (Zainea et al., 2020). Some authors consider that social responsibility and/or corporate social responsibility encompass volunteering, irrespective of the domain of activity (Marinescu, Toma and Constantin, 2010; Imbrișcă and Toma, 2020) or the size of the organization (Toma, 2008; Toma and Marinescu, 2011; Toma, Burcea and Papuc, 2011; Toma and Hudea, 2012).

Volunteering is an activity of public interest that takes place in various fields such as social assistance, education, health, environmental protection, art, culture, human rights, community development, etc. (according to art. 3 lit. b) of Law no. 78/2014).

Volunteering has been defined as a free choice, not forced labor or slavery, which involves lack of remuneration, and is pursued for the benefit of another person or society in general (Cnaan,

et al.,1996; National Council for Voluntary Organizations, 2005; Butcher, 2010; International Labour Office, 2011)

Megan and Maryam (2015) point out that volunteer work is a key pillar in strengthening social relations, being a concept closely related to the meanings of kindness, humanity and feelings of others, which are no longer limited to charity or social development.

Volunteering has also been assimilated to spending free time constructively (Wilson, 2000; Hallmann & Rasciute, 2020), as new skills and abilities can be accumulated through the participation at this activity (Elkington and Stebbins, 2014; Zainea et al., 2019). Participation in volunteer activities contributes to the personal development of individuals by increasing self-esteem and self-confidence, as well as expanding the network of friends (Andronic, 2014; Aydinli et al. 2016; Shantz et al. 2019).

Peace, freedom, security and justice for all are unanimously accepted values mentioned in the Universal Declaration on Volunteering (IAVE, 2001), a document which emphasizes the complexity of interdependence between states, in an age of globalization marked by innovation, technological progress, and continuous change (Toma and Marinescu, 2015).

The above-mentioned definitions highlight the fact that volunteering is a complex and multidimensional concept, whose activity is conducted in various fields, as well as in the entire social spectrum. Volunteering is a free choice based on the people's desire to do good for others, which contributes to the social network expansion and represents a way to spend free time in a constructive manner, as through the implication in voluntary activities benefits can be obtained, at both levels, individually and socially.This activity promotes universal values, and the involvement in volunteer programs gives individuals an honorable position in the community.

The fundamental elements of the universe

Over time, the four fundamental elements, namely water, air, fire and earth, have been approached differently. A first perspective was that these elements are the basis of matter and describe certain processes that take place in nature. Water indicates the processes that help things grow and is a life support. Air is the environment in which energy is transferred between the other elements. Fire generates heat, light and transforms matter, by returning it to its original stage. The earth represents matter and resources of physical nature. These elements represent the matter aggregation states, respectively water - liquid state, air - gaseous state, fire - plasma (weakly ionized), earth - solid state (Ciubotaru, 2020).

In the antiquity, the thinkers of the time divided the physical world, into the four basic elements,

and they believed that they had equal powers, different characteristics, and that their mixture generated or destroyed the forms in nature. Thus, there are four stages of life, four moments of the day and four seasons.

The second perspective consisted in approaching the four astrological elements as factors that can explain how we live or react to environmental challenges, as they are reflected in the feelings, expectations and behaviors of individuals, as well as in their relationships.

Thus, the twelve zodiac signs, correspond to each month of the year and according to some beliefs, it might influence people's destiny and were associated with the fundamental elements, as follows: water signs (Cancer, Scorpio, Pisces), air signs (Gemini, Libra, Aquarius), fire signs (Aries, Leo, Reaper) and earth signs (Taurus, Virgo, Capricorn).

According to the Greek thinkers the four fundamental elements influence human character, as they are found in people's temperament, namely choleric, sanguine, melancholic and phlegmatic (Ashton, 2018).

The reflection of the fundamental elements in the literature

The fundamental elements of the universe have been mentioned in the literature, scientific, historical works of various authors to plastically describe the journey through life with its opportunities and obstacles, multiple events, rituals or to express some values, principles, moods, human behaviors, as well as the indissoluble relationship between human and nature.

Therefore, the Romanian poet, writer and essayist, Nichita Stănescu, in the poem Autumn Emotion (part of the volume A Vision of Feelings, 1964), fire is associated with the moon and suggests the romance of the relationship between the two lovers, as well as the intensity of love ("I whistle the moon and it rises and I turn it into a great love''), while the air makes its presence felt throughout the poem, being the conducive environment for the transmission of vibrations, emotions and message to the reader. The water is represented by the sea ("I take the words and drown them in the sea"), and the earth can be associated with the stones ("…and then I approach to the stones and cue"), the lyrics are suggesting the state of fear and loneliness on the one hand, the fact that love is a perennial feeling that can be transposed into an imaginary world and overcomes any obstacle, on the other hand.

The Romanian writer and Doctor in Philology, Ion Pachia - Tatomirescu (1999), highlighted in one of his aphorisms the strength of an element in relation to the others, stating that "water has the greatest power, extinguishes fire, gnaws the earth, rejuvenates the air". In another aphorism he emphasized the positive role of the human and the indestructible relationship with nature and argued that "the four elements are: water, air, fire, earth; and I, in their midst, reconciling them".

3. Research methodology

The author used a descriptive research method to accomplish the scope of the paper. The literature review was done based on comprehensive research from multiple sources found in electronic data bases, such as international journals (e.g.Non-profit and Voluntary Sector Quarterly, Equality, Diversity and Inclusion), articles and books (e.g., Elsevier, Google Scholar, Springer),and in various Romanian libraries (e.g. Romanian National Library, The Central University Library from Bucharest „Carol I"). The data was thoroughly selected and grouped into categories. Then, the information was analyzed, correlated, and synthesized. Finally, the author designed the article.

4. Results and discussions

Since education is the character culture, culture is the education of the mind (Eminescu, 1980), and we need above all to learn again to believe in the possibility of nobility of spirit in ourselves (O Neill, 2007), also the sense of duty is the brightest proof of the health of a soul (Iorga), it can be said that volunteering encompasses three visions, as it provides a favorable framework for education and training of socially responsible people, as well as helping people in need and it creates spiritual fulfillment.

The author defines volunteering as the omnipresent reality reflected in the collective mind, which concentrates the purifying spring of national identity, the sacred, light-giving fire that burns brightly in each of us, as well as the hidden, but living cornerstone of universal culture, while vibrating in the space between sky and earth, the same for all inhabitants of the planet, giving a special meaning to the world in which we coexist.

From the definition presented above, it can be concluded that volunteering is a well-known concept, an activity often found around the globe, a fact reflected in the collective consciousness of each person, a psychological trait transmitted through education from one generation to another, from ancient times to the present.

This concept gathers the national identity, the creative enthusiasm of each person with the values, the unanimously recognized norms and represents a common language for all the inhabitants of the planet.

The national identity, respectively the set of life norms, values, beliefs, traditions, customs, specific interests of people, is assimilated to water, the symbol of purity, which purifies, heals society from bad morals and strengthens the feeling of national pride and loyalty to the community members.

The desire to do good for other individuals and the creative enthusiasm that exists in each of us, in different degrees of manifestation, are similar to fire, the symbol of light and warmth, as we evolve through the participation in volunteering activities, by bringing to the surface the best from the depths of our being.

The universal culture is represented by the earth, the symbol of the fertile land in which we sow seeds and harvest fruits, respectively ideas, opinions, beliefs, traditions that develop; universal culture is the cornerstone, the basic element of any construction, it is mysterious because it hides many unknown things, and it is alive because it is continuously enriched with each new experience.

The environment in which the communication between the inhabitants of the planet is made is assimilated with the air. In this space between sky and earth, the universal language of volunteering is transmitted from one generation to another, and it is based on unanimously recognized values, such as peace, freedom, non-discrimination, solidarity and social justice. This activity can be seen not only as service done for the benefit of other people or the community, but also as a proof of faith.

Volunteering is crucial in a globalized world, as it is an effective tool for gaining people's trust, developing skills or acquiring new abilities and stimulating creativity to identify innovative and sustainable solutions which contributes to solve the community existing problems and social change.

5. Conclusions

Currently, in the context of new challenges due to globalization, international competition, poverty, demographic aging, factors that have a major impact over the economic performance and states social policies, volunteering is a viable solution that promotes multiculturalism, social dialogue, partnerships, increase social inclusion and influences positive the active involvement of individuals in community life.

The holistic approach of volunteering, on the one hand, and the acceptance of the statement that motivation is the power that stimulates action, on the other hand, helps to understand that the people's desire to do good for others and the power of conscience are key factors that can shape reality and lead to the formation of socially responsible behavior of individuals.

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THE EVOLUTION OF THE WORLD'S LARGEST ECONOMIES IN THE PERIOD 2017-2020

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Abstract: *In the age of risk and uncertainty, countries and companies are competing in a turbulent global environment. In this respect, they have to face a plethora of different challenges, such as the COVID-19 pandemic, disruptive technologies, demographic explosion, or climate change. A highly interconnected global economy imposes countries to compete not only for resources and markets but also to seek to hold a better place in this huge world economic network. The aim of the paper is to present the evolution of the world's largest economies in the period 2017-2020 by taking into account their gross domestic product. The methodology was based on a quantitative research method. Starting from a comprehensive literature review, it demonstrates that the hierarchy of the world's ten biggest economies by GDP was dominated by two countries, the United States of America and China.*

Keywords: economy, gross domestic product, country, purchasing power parity

JEL Classification: E01, F00

1. Introduction

Since the fall of the Berlin Wall, the globalization process has rapidly expanded all over the world (Crafts, 2000). Numerous and considerable flows of money, people, information, goods and services have dramatically spread at a record pace in recent decades (Sharma, 2017) and led to the emergence of a new globalized world economy in which it has become "increasingly difficult to use old formulas and paradigms to predict what's going to happen in the future" (Epping, 2020, p.3).

In the age of risk and uncertainty, countries and companies are competing in a turbulent global environment (Toma and Marinescu, 2013; Toma and Marinescu, 2015). In this respect, they have to face a plethora of different challenges, such as the COVID-19 pandemic, disruptive technologies, demographic explosion, or climate change (Catană et al., 2020). On the one hand, a highly interconnected global economy imposes countries to compete not only for resources (e.g., oil, water, natural gas) and markets (Garelli, 2006) but also to seek to hold a better place in this huge world economic network. This is why every country should design and implement its own strategy for economic development and growth. It is said that this strategy has to fit "each country's context- the national and international conditions in which the country operates" (Vietor, 2007, p.7). On the other hand, business organizations seek to identify and implement successful business models and strategies in the current Fourth Industrial Revolution, characterized by innovation, Internet of Things, digitalization, and robotization (Tohănean et al., 2018). Consequently, various methods and techniques from management, leadership, marketing, quality management, or strategy (e.g., lean management, marketing mix) have been used by managers to obtain better performances (Săseanu et al., 2014; Grădinaru et al., 2016; Catană and Toma, 2021).

The aim of the paper is to present the evolution of the world's largest economies in the period 2017-2020 by taking into account their gross domestic product (GDP). The paper is structured as follows: the literature review is displayed in the second section. The research methodology is presented in the third section of the paper. The fourth section shows the results of the research. The paper ends with conclusions.

2. Literature review

There are many definitions of the key concepts used in our research- economy and GDP- in the literature. Without an agreed-upon definition, economy represents:

- "the distribution of wealth in a society and the means by which that wealth is produced and consumed" (The Chartered Management Institute, 2004, p.147).
- "the financial state of a country, or the way in which a country makes and uses its money" (Collin, 2007, p.132).
- "the system for organizing the money and industry of the world, a country, or local government" (Brookes, 2011, p.164).

On its turn, the GDP:

- is "a measure of the total flow of goods and services produced by the economy over a particular time period, normally a year" (Bannock, Baxter and Rees, 1977, p.187).

• "includes activities carried on in the country by foreign-owned companies, and excludes activities of firms owned by residents but carried on abroad" (Black, 1997, p.204).

• "is the traditional measure of the total output of goods and services per year" (Epping, 2020, p.27).

Most economists and statisticians use the GDP, either at its nominal value or at the purchasing power parity (PPP), as a key indicator in measuring the performance of economies worldwide. The PPP considers that "the exchange rate between two currencies is in equilibrium when the purchasing power of currency is the same in each country" (The Chartered Management Institute, 2004, p.349).

3. Research methodology

In order to attain the aim of the paper, the authors employed a methodology based on a quantitative research method. They collected, synthesized, and analysed numerous information from different secondary sources of data through desk research. On this line, the authors identified and gathered information from a plethora of articles and books found in various electronic databases and libraries.

4. Results and discussion

In the period 2017-2020, the world's ten biggest economies by GDP at its nominal value were pretty the same (Tables 1, 2, 3 and 4). The only newcomer was South Korea who replaced Canada in the 2020 top. By obtaining a GDP that surpassed $18 trillion in 2017, and $19 trillion in 2018, 2019 and 2020, the United States of America (USA) clearly dominated the hierarchy being followed by the People's Republic of China.

Table 1: The world's ten largest economies by GDP (nominal) in 2017 (constant 2015 US$)

No.	Country	GDP ($ trillion)
1.	USA	18.983
2.	China	12.640
3.	Japan	4.553
4.	Germany	3.523
5.	United Kingdom	3.088
6.	France	2.521
7.	India	2.432
8.	Italy	1.891
9.	Brazil	1.766
10.	Canada	1.620

Source: World Bank, 2021

Table 2: The world's ten largest economies by GDP (nominal) in 2018 (constant 2015 US$)

No.	Country	GDP ($ trillion)
1.	USA	19.552
2.	China	13.493
3.	Japan	4.579
4.	Germany	3.561
5.	United Kingdom	3.139
6.	India	2.591
7.	France	2.568
8.	Italy	1.908
9.	Brazil	1.798
10.	Canada	1.659

Source: World Bank, 2021

Table 3: The world's ten largest economies by GDP (nominal) in 2019 (constant 2015 US$)

No.	Country	GDP ($ trillion)
1.	USA	19.975
2.	China	14.296
3.	Japan	4.591
4.	Germany	3.599
5.	United Kingdom	3.191
6.	India	2.696
7.	France	2.616
8.	Italy	1.916
9.	Brazil	1.823
10.	Canada	1.690

Source: World Bank, 2021

Table 4: The world's ten largest economies by GDP (nominal) in 2020 (constant 2015 US$)

No.	Country	GDP ($ trillion)
1.	USA	19.247
2.	China	14.632
3.	Japan	4.381
4.	Germany	3.434
5.	United Kingdom	2.882
6.	India	2.500
7.	France	2.410
8.	Brazil	1.749

9.	Italy	1.745
10.	South Korea	1.624

Source: World Bank, 2021

By measuring the GDP at the PPP, the hierarchy of the the world's ten largest economies changed dramatically. Thus, the Chinese economy

succeeded in overcoming the American economy in the same period of time (Tables 5, 6, 7, and 8).

Table 5: The world's ten largest economies by GDP (at PPP) in 2017 (constant 2017 US$)

No.	**Country**	**GDP ($ trillion)**
1.	USA	19.247
2.	China	14.632
3.	Japan	4.381
4.	Germany	3.434
5.	United Kingdom	2.882
6.	India	2.500
7.	France	2.410
8.	Brazil	1.749
9.	Italy	1.745
10.	South Korea	1.624

Source: World Bank, 2021

Table 6: The world's ten largest economies by GDP (at PPP) in 2018 (constant 2017 US$)

No.	**Country**	**GDP ($ trillion)**
1.	China	21.229
2.	USA	20.129
3.	India	8.818
4.	Japan	5.292
5.	Germany	4.434
6.	Russia	3.914
7.	United Kingdom	3.114
8.	Brazil	3.073
9.	Indonesia	3.044
10.	France	3.039

Source: World Bank, 2021

Table 7: The world's ten largest economies by GDP (at PPP) in 2019 (constant 2017 US$)

No.	Country	GDP ($ trillion)
1.	China	22.492
2.	USA	20.564
3.	India	9.174
4.	Japan	5.306
5.	Germany	4.481
6.	Russia	3.994
7.	Indonesia	3.197
8.	United Kingdom	3.166
9.	Brazil	3.116
10.	France	3.095

Source: World Bank, 2021

Table 8: The world's ten largest economies by GDP (at PPP) in 2020 (constant 2017 US$)

No.	Country	GDP ($ trillion)
1.	China	23.020
2.	USA	19.815
3.	India	8.509
4.	Japan	5.063
5.	Germany	4.276
6.	Russia	3.876
7.	Indonesia	3.130
8.	Brazil	2.989
9.	United Kingdom	2.859
10.	France	2.852

Source: World Bank, 2021

The above results reveal several issues during the period 2017-2020. In this respect, some of the most important of them can be outlined as follows:

- USA and China were the two main economic actors and superpowers within the world economy. They are competing head-to-head in order to achieve the global economic supremacy.
- USA dominated the hierarchy of the world's ten biggest economies by GDP at its nominal value.
- China dominated the hierarchy of the world's ten biggest economies by GDP at the PPP. In the last decades, China has made huge efforts to become an economic superpower and heavily invested in the New Silk Road or the Belt and Road Initiative.
- The appearance and worldwide spread of the COVID-19 pandemic profoundly influenced the economic performance of all economies.

• The so-called "BRIC Group" (Brazil, Russia, India, China) held top positions in the hierarchy of the world's ten biggest economies.

Conclusions

The topic of the world's largest economies has constituted a subject of interest for researchers worlwide in the past decades. Consequently, there was an expansion of the literature associated with this interesting and challenging topic.

The paper briefly presents the concepts of economy and GDP. Starting from a comprehensive literature review, it demonstrates that the hierarchy of the world's ten biggest economies by GDP was dominated by two countries, the USA and China. Further researches may take into account other indicators and, therefore, deepen the analysis of the largest economies of the world.

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