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Preface

Economic development refers to enhancing economic activities in a society, resulting in positive changes in both the socio-economic structure and living standards. Sustainable economic development aims to eradicate poverty, inequality, and unemployment, ultimately promoting social inclusion and improving the overall quality of life. Consequently, analyzing this crucial issue requires a highly interdisciplinary approach.

The issue of sustainable economic development has gained recognition and attention from esteemed academic institutions in the Balkans region and the Czech Republic. Notably, University of National and World Economy – Sofia, Bulgaria; Faculty of Economics and Business, Mediterranean University – Podgorica, Montenegro; Faculty of Commercial and Business Studies – Celje, Slovenia; Faculty of Applied Management, Economics and Finance, Belgrade; Association of Economists and Managers of the Balkans along with the AMBIS University from Prague, Czech Republic have recognized the following issue and organized the 8th International Scientific Conference titled: *Knowledge Based Sustainable Development – ERAZ 2022* online/virtually (Prague, Czech Republic) on May 26, 2022.
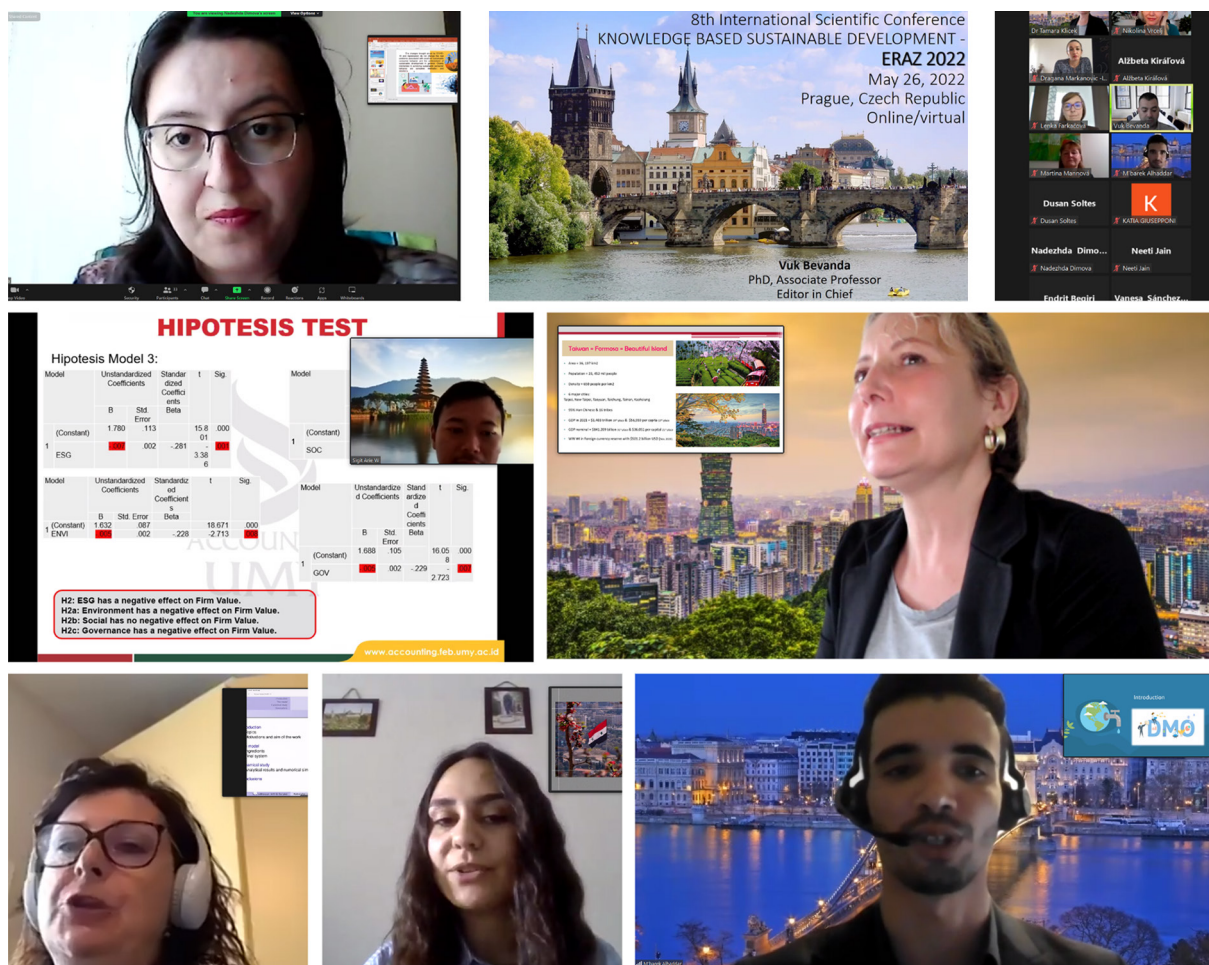
The primary aim of the conference was to facilitate the gathering of the academic community, including experts, scientists, engineers, researchers, students, and other interested parties, with the purpose of disseminating scientific knowledge and promoting personal and collective growth. To achieve this goal, the conference provided a platform for the presentation and pub-

lication of scientific papers, as well as interactive discussions and other forms of interpersonal exchange, which enabled participants to share their experiences and knowledge. The conference program was designed to cover the latest scientific developments in the following areas:

- Microeconomics and macroeconomics,
- Economic policy,
- International Economics and Trade,
- International Business,
- Economic diplomacy,
- Lobbying,
- Globalization,
- European business,
- Modern management and innovation,
- Business and Public Finance,
- Fiscal policy,
- Stock exchange and financial markets,
- Risk management,
- Insurance and reinsurance companies,
- Financial Management and Banking,
- Modern forms of entrepreneurship and investment,
- Investment Management,
- Enterprise and Learning,
- Women and Entrepreneurship,
- Corporate entrepreneurship,
- Agribusiness Strategy,
- Marketing and trade,
- Marketing services,
- Marketing of non-profit sector,
- Research in marketing,
- Marketing in education,
- Marketing in sport,
- Marketing in culture,
- Accounting and auditing,
- Quality management,
- Labor law,
- Business law,
- The role of the rule of law in the country's progress,
- Human rights and protection of minorities,
- Legal aspects of EU integration,
- Intellectual Property Law,
- The reform of corporate law in countries in transition,
- CEFTA,
- Ecology and energy,
- Renewable energy,
- Energetic efficiency,
- Information technology and business intelligence,
- The use and integration of new technologies,
- E-society and E-learning,
- Sustainable tourism,
- Hospitality

Within publications from the ERAZ 2022 conference:
- 11 double peer reviewed papers have been published in the International Scientific Conference ERAZ 2022 – Knowledge Based Sustainable Development – **Selected Papers,**
- 37 double peer reviewed papers have been published in the International Scientific Conference ERAZ 2022 – Knowledge Based Sustainable Development – **Conference Proceedings**,
- 70 abstracts have been published in the International Scientific Conference ERAZ 2022 – Knowledge Based Sustainable Development – **Book of Abstracts.**

ERAZ 2022 publications have nearly 600 pages.

The conference attracted the participation of over **100 researchers** from **20 different countries**, including Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, India, Indonesia, Italy, North Macedonia, Palestine, Portugal, Romania, Russia, Serbia, Slovakia, Spain, Taiwan, Turkey, and Ukraine. These researchers came from a diverse range of academic institutions, such as universities, eminent faculties, and scientific institutes, as well as from colleges, various ministries, local governments, public and private enterprises, multinational companies, and associations.

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Analysis of the Mechanism of the Common Organization of the Markets for Agricultural Products in the European Union

Krassimira Zagorova[1]

Abstract: *The Common Organization of the Market for Agricultural Products in the European Union is part of the common agricultural policy, which ensures both stable and predictable markets and resilient purchase prices, which in turn safeguards farmers' stable earnings and provides constant supply of quality food to consumers.*

The aim of this study is to analyze the applicability and adaptability of the mechanism of the common organization of markets in the EU, including: its internal aspect, mainly related to interventions in the market for agricultural products, and its external aspect related to the trade with third countries, import and export licenses, refund of part of costs associated with exporting agricultural products produced in the Community, etc.

The Common Organization of Markets, as a basis for implementing the EU Common Agricultural Policy, operates within a financial framework periodically updated by the European Commission in order to adequately implement the principle of subsidiarity, allowing EU Member States to play a key role in terms of interventions in the agricultural sector.

1. INTRODUCTION

The Common Organization of the Market for Agricultural Products in the European Union is part of the common agricultural policy, which ensures both stable and predictable markets and resilient purchase prices, which in turn safeguards farmers' stable earnings and provides constant supply of quality food to consumers. The measures relating to the support of agricultural markets are funded by the European Agricultural Guidance and Guarantee Fund. Some of the measures to support the markets are horizontal and apply to all sectors of agriculture, others apply only to one or more agricultural products (Ministry of Agriculture, R. Bulgaria, 2021). The Common Organization of Markets aims to achieve the objectives of the Common Agricultural Policy (CAP) of the European Union - Art. 40 of the Treaty on the Functioning of the European Union (TFEU), and in particular - to stabilize the markets for agricultural products, to ensure a fair standard of living for farmers and increase productivity in the agricultural sector.

The foundation of the EU's Common Agricultural Policy is based on two main components, namely:
- common organization of agricultural markets, and in particular of the measures relating to the EU's foreign trade in agricultural products;
- socio-structural measures applied in combination with other Community policies, including socio-economic and regional policy, climate and environmental policy, etc.

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2. SCOPE, PRINCIPLES AND MECHANISMS OF FUNCTIONING OF THE COMMON ORGANIZATION OF MARKETS IN THE EUROPEAN UNION

The Common Organization of Markets (CMO) includes a series of mechanisms regulating the production and trade of products in the EU, the composition of which is specified in Annex I to the Treaty on the Functioning of the EU (TFEU), incl. meat, fish, eggs, animal and dairy products, cereals, vegetable plants, tea, coffee, spices, oilseed crops, etc. These mechanisms offer guarantees that vary depending on the specific character of the types of agricultural production.

The market measures of the Common Market Organization (CMO) are part of the first pillar of the EU's Common Agricultural Policy. In other words, in its early stage CMO mainly relies on guaranteed prices which gradually go down, followed by initially complete and subsequently partial compensation through the granting of direct aid to farmers. Direct financial aid is realized through the application of various types of subsidies applying to both production and product commercialization, general mechanisms for stabilizing exports and imports, storage systems as part of intervention measures, etc.

The rules of the Common Organization of Markets are extremely complex and include:
a. internal aspect - market interventions, rules on the admission to the market of producer organizations, and
b. external aspect – regarding the trade with third countries, import and export licenses, import duties, tariff quota administration, export refunds, etc.

The Common Organization of Markets, as a main part of the EU's Common Agricultural Policy, is based on the following principles (Turlakova, 2013, p.21):
•	common prices and market unity;
•	agricultural protectionism within the Community (Community preference);
•	financial solidarity of the Member States through applying the market intervention mechanism.

Market unity means that agricultural products, like all other goods, can circulate freely without any restrictions on the EU's internal market. Common prices are not market prices, they are not formed freely under the influence of market factors, but are rather "institutional" prices, which, after their initial fixing, are established by the EU Council on an annual basis.

Community preferences are, in essence, linked to the importance of the Community's foreign trade in agricultural goods. The principle of Community preference means that Community's production is always protected from competitive imports from third countries and international price fluctuations, and is preferable to foreign production.

The principle of "financial solidarity" means that all agricultural costs are borne by the EU budget, i.e. all Member States jointly participate in the financing of the Common Agricultural Policy. This is done through a special fund - European Agricultural Guidance and Guarantee Fund (Turlakova, 2013, p.22).

Following a series of reforms going along with the development of the EU's Common Agricultural Policy, in 2003 it was decided to proceed to a revision of the sector's financial support mechanism with the result being that greater portion of the direct aid is gradually "decoupled"

from volumes produced, moving on to the introduction of a single payment regime (Single Farm Support Scheme).

In other words, with the 2003 reform, the Member State Ministers of Agriculture deeply re-structured the EU's Common Agricultural Policy (CAP), introducing new principles and mechanisms such as (Factsheets on the European Union, CAP Tools and Reforms Thereof, 2021):

- **decoupling aid from volumes produced,** to allow farms to better adapt to market conditions by minimizing production interruption and agricultural market distortion;
- **cross-compliance**, which links payments to the adherence to a set of environmental and public health criteria in response to the expectations of European citizens;
- **compatibility with WTO's rules**, in so far as decoupling of aid is ultimately intended to allow the single payment scheme to be included in the "Green Box"[2];
- **re-distribution of payment entitlements** allocated to farms via two mechanisms: modulation- to transfer budgetary resources between the two pillars[3] of the Common Agricultural Policy in order to strengthen rural development, and implementation of a regional decoupling model allowing harmonization of payments per hectare in accordance with adopted territorial criteria;
- **establishment of a Single Common Market Organization** (SCMO) in 2007, which systematizes the mechanisms for regulating the existing 21 common market organizations.

Until the entry into force of the Single Common Market Organization in 2007, the individual common market organizations relating to various agricultural products produced in the EU existed in parallel, each governed by a separate specific regulation of the Council of the Union. Thus, successive reforms are intended to modify both internal and external intervention instruments, which are currently considered „safety nets", meaning that they only apply in the event of crises involving significant market disruption. As far as price support is concerned, only intervention prices[4] are secured, and the scale of intervention is significantly limited.

3. FUNDING OF THE COMMON ORGANIZATION OF MARKETS IN THE EUROPEAN UNION

The Common Organization of Markets in the EU is funded by the European Agricultural Guidance and Guarantee Fund. The Fund is structured in two sections: the Guarantee Section and the Guidance Section. The Guarantee Section covers the vast majority of the Fund's resources (approximately 70%) and is a key tool for ensuring a stable income for farmers and guaranteeing the prices of agricultural products in the Community, whereas the funding out of the Guidance Section is aimed at implementing the structural policy in the agricultural sector, subsidizing and adapting production to the market, improving the quality of agricultural production, etc.

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[2]   The "Green Box" covers two types of aid. *The first* is focused on public services programmes (research, training, promotion, encouragement, infrastructure, domestic food assistance or state food reserves). *The second* is related to direct payments to producers, which are completely decoupled from production and are mainly related to guaranteed income and security programmes (natural disasters, state financial participation in crop insurance, etc.), for programmes introduced towards structural adaptation, as well as for programmes related to environmental protection.

[3]   The measures related to the functioning of the EU's Common Agricultural Policy (CAP) are structured in two complementary pillars: annual direct payments and market support to farmers (first pillar of CAP) and multi-annual rural development measures (second pillar of CAP).

[4]   Intervention prices - guaranteed prices at which an intervention agency designated by the Member States buys quantities produced and stores them.

The difference between international and higher purchase prices within the Union is refunded with financial resources provided by the Guarantee Section. Overstock of certain crops is bought to regulate the supply and demand thereof and maintain a high level of their domestic prices. Cash resources are also spent on export subsidies, etc." (Turlakova, 2013, p.42).

In accordance with the principles of the Treaty on the Functioning of the EU, the financial assistance provided by the European Agricultural Guidance and Guarantee Fund is predominantly directed toward (Directorate for Programming of EU Funds at the Administration of the Council of Ministers of the Republic of Bulgaria, 2020):
- reinforcing and reorganizing agricultural and forestry structures, including those engaged in the marketing and processing of agricultural and forestry products;
- ensuring the adaptation of agricultural production and encouraging the development of additional activities for farmers;
- supporting the provision of a fair standard of living for those employed in the sector, improving the development of social networks within agricultural zones, protecting the environment and nature;
- providing technical assistance and information, as well as support towards conducting research activities and developing pilot projects to promote agricultural development at the Community level.

In 2019, the measures related to interventions in the agricultural markets within the Community approximately amounted to EUR 3.4 billion, or 5.5% of the total expenditure of the European Agricultural Guarantee Fund (EAGF). Table 1 provides data on the costs of interventions in EU agricultural markets, the costs of refunds on exports of agricultural products produced in the Community, as well as other market measures to support the EU's agricultural sector.

Table 1. EAGF costs of interventions in agricultural markets
(in millions of EUR, current prices)

Types of EAGF costs	2012	2013	2014	2015	2016	2017	2018	2019
Storage	17,4	25,1	5,1	18,4	52,4	27,6	182,3	3,0
Export refunds	146,7	62,4	4,5	0,3	0,6	0,0	0,2	1,1
Other market measures	3 344,5	3 217,2	2 579,6	2 698,0	3 185,2	3 061,1	2 544,6	2 427,8
Total:	3 508,6	3 304,7	2 589,2	2 716,7	3 238,2	3 088,7	2 727,1	3 431,9

Source: Financial reports of the Commission to the European Parliament and the Council. Factsheets on the European Union. First pillar of CAP (2021a)

The data contained in Table 1 show a reduction and decrease in the total intervention costs for agricultural products in the EU for the years 2014 and 2015, as since 2016 the dynamics of the costs of interventions in agriculture have been variable, reaching a high level again in 2019. The data also show a drastic reduction in the financial cost of the European Agricultural Fund, intended for refunds on exports of agricultural products originating from the Community, whose amount reached EUR 1.1 million in 2019, compared to EUR 179.4 million in 2011, EUR 62.4 million in 2013, etc. (see Table 1 and Figures 1, 2).

At this stage, unlike direct aid to support farmers and aid for rural development, market measures in the agricultural sector are not subject to funding from the EU's agricultural budget. For the period 2014-2020, market policy funds in the agricultural sector, including the crisis reserve, approximately form 4% (EUR 17.5 billion) of the budget of EU's Common Agricultural Policy.

In this regard, it must be clarified that a decision of the European Commission of 2018 introduces a reduction in support payments allocated under the first pillar, in the event that their amount exceeds EUR 60,000 per farm, as well as a mandatory limit as regards maximum support of up to EUR 100 000 per farm for activities under both the first and second pillar of the agricultural sector. Restructuring of payments is also envisaged as sectoral intervention programmes are shifted from the Common Organization of Agricultural Markets in the European Union to the national strategic plans for development of the agricultural sector.
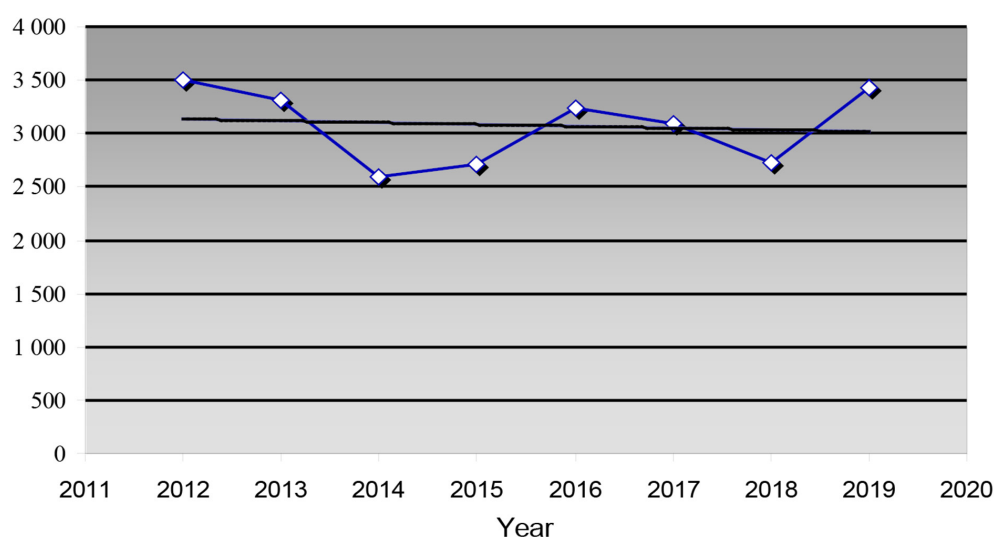
Figure 1. EAGF costs of interventions in EU agricultural markets
(in millions of EUR, current prices)
Source: Financial reports of the Commission to the European Parliament and the Council.
Factsheets on the European Union. First pillar of CAP (2021b)
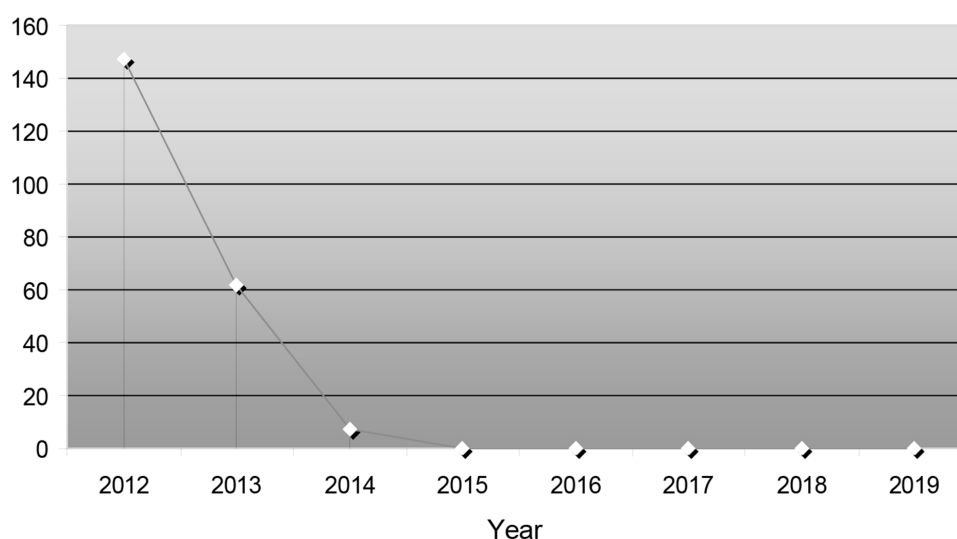
Figure 2. EAGF costs of refunds on exports of agricultural products produced
in the Community (in millions of EUR, current prices)
Source: Financial reports of the Commission to the European Parliament and the Council.
Factsheets on the European Union. First pillar of CAP (2021c)

4. CONCLUSION

In conclusion, it can be generalized that the Common Market Organization (CMO), as a basis for implementation of the EU's Common Agricultural Policy (CAP), is stipulated to operate in an updated multiannual financial framework adopted by the European Commission in May 2018.

At the heart of the newly adopted framework is the model for implementing the EU's Common Agricultural Policy, focused on the principle of subsidiarity, allowing EU Member States to play a much more important role in terms of interventions in the agricultural sector. In other words, in the future the Union should set the following key parameters: Common Agricultural Policy objectives, basic requirements, main types of interventions under the first pillar, as Member States should draw up multi-annual strategic plans to achieve the specific objectives and target levels agreed upon. Despite the mentioned changes, direct payments continue to be priority elements in the new EU Common Agricultural Policy (Factsheets on the European Union. Towards a Common Agricultural Policy After 2020, 2021a).

In the context of the above, the adopted new way of designing and managing the so-called "greening architecture" of the Common Agricultural Policy in the EU should also be taken into consideration, which is also entrusted to the relevant national authorities and institutions. In other words, the new "greening architecture" of the Community's Common Agricultural Policy will include three main directions: a new system of preconditions (mandatory but more resilient in terms of details), Eco-schemes for the environment and climate, to be funded by the European Agricultural Guarantee Fund (EAGF) and to replace existing greening payments, as well as agri-environmental measures (Factsheets on the European Union. Towards a Common Agricultural Policy After 2020, 2021b).

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Effective Public Administration of Agro-exports in Disruptive Times – The Way to Make Rural Territories Sustainable

Oksana Kiforenko[1] (iD)

Abstract: *Effective public administration is a key prerequisite for the successful functioning of any sphere of social functioning. Ukraine takes the leading place in the production and exporting of many agricultural items. In the research, special attention is paid to the sustainable development of Ukraine's rural territories due to the extreme importance of agriculture either for the country's own population or for its trading partners.*

The data analysed in the article were taken from the official web page of the State Statistics Service of Ukraine. While analysing the agro – exports of Ukraine, "agro" denotes the commodity from the groups I—IV of the Ukrainian Classification of Commodities in Foreign Trade. The timeframe under analysis is nine years – from 2012 to 2020 included. The appropriate statistical software and tools as well as tabular and visualization methods were used to conduct the research and present its results in the article.

The research and its results will be interesting and useful for public administration officials, companies' managers engaged in agriculture and international trade, decision makers, academic community representatives as well as beginners and experienced data analysts.

1. INTRODUCTION

Agriculture is vitally important for all the creatures on the planet Earth as it provides food for people, forage for animals, raw materials for the processing industries, foreign currency inflow for countries' budgets, etc. In addition, agriculture gives employment opportunities as well as livelihood for those living in villages and earning their living directly or indirectly from agriculture (NCERT-Solution, 2001). Due to the differences in the geographical location, climatic conditions, availability of workforce and financial resources, the exchange of agricultural and food products is necessary either for food security or access to food of better variety at lower prices. The notion of agricultural trade dates back to the times of the Romans; since then, agricultural trade has expanded into a global enterprise and includes countless commodities (Delich, 2022).

With the flow of time, the intersection of international trade and agriculture has become increasingly important as more and more countries and their farmers participate in global markets nowadays (Ching & Khor, 2013). Due to the interdependence of the international markets in a global marketplace, supply and demand in one area of the world can greatly impact agricultural production in another (USDA, n.d.). The increase in agricultural product exports contributes to the modernization of the production practices and expansion of food processing industries. In addition, it boosts other value-added industries along the supply chain, while creating employment opportunities for both farmers and other supply chain actors (UNESCAP, n.d.).

The quality of a country's public administration is key to its economic performance and the well-being of its citizens (EIPA, n.d.). Effective public administration is a prerequisite for the

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successful functioning of any social sphere. Public administration of agricultural products exports, including national trade policies and international trade rules can have a significant impact on food security due to the increasing importance and binding nature of multilateral, regional and bilateral trade agreements (Ching & Khor, 2013). The importance of effective public administration comes to the front page, especially under extreme conditions or critical situations. Under the war conditions, Ukraine has to survive and function nowadays, effective public administration has gained vital importance for the survival of its population and the stable functioning of the country. Agricultural export is very important not only for Ukraine itself but for many trading partners of it as well. Therefore, the effective public administration of Ukrainian agricultural exports plays a significant role in the country's survival and the food security of its trading partners.

2.   RESULTS AND DISCUSSION

As a result of the current challenges influence, many countries have refocused attention on the agricultural sector and sought new policy responses to enhance food security, employment creation and structural transformation (Cheong, Jansen & Peters, 2013). Agriculture has vital importance for Ukraine, especially in the current disruptive times. The agricultural products exports ensure food security not only for Ukraine itself but for many countries around the world, especially those underdeveloped ones. The obstacles to agro–exports from Ukraine threaten the food security in many countries creating the prerequisites for the world hunger situation. Due to the extreme importance of Ukrainian agriculture as a whole and the exports of agricultural products, in particular, the effective public administration of those economic sectors becomes topical, especially nowadays.

The public administration for the agricultural sector of the Ukrainian economy in general and the exports of its agricultural products, in particular, are carried out by two Ministries - the Ministry of Agrarian Policy and Food of Ukraine and the Ministry of Economy. The Ministry of Agrarian Policy and Food of Ukraine forms and implements (among others) the state agricultural policy, state policy in the domains of agriculture and food security of the state, plant cultivation, rural development, horticulture, viticulture, winemaking, hop growing, food and processing industry, farming development, agricultural cooperation, agricultural advisory activities, etc. (Ministry of Agrarian Policy and Food of Ukraine, 2021). The Ministry of Agrarian Policy is guided in its activities by the Constitution and laws of Ukraine, decrees of the President of Ukraine and resolutions of the Verkhovna Rada of Ukraine adopted in accordance with the Constitution and laws of Ukraine, acts of the Cabinet of Ministers of Ukraine and other legislation (Ministry of Agrarian Policy and Food of Ukraine, 2021). As for the Ministry of Economy, it is the central body of executive power, the activities of which are directed and coordinated by the Cabinet of Ministers of Ukraine, that (among others) forms and implements the state policy of economic, social development and trade, state foreign economic policy, etc. (Cabinet of Ministers of Ukraine, 2022). The Ministry of Economy is guided in its activities by the Constitution and laws of Ukraine, decrees of the President of Ukraine and resolutions of the Verkhovna Rada of Ukraine adopted in accordance with the Constitution and laws of Ukraine, acts of the Cabinet of Ministers of Ukraine and other legislative documents (Cabinet of Ministers of Ukraine, 2022).

The state institutions mentioned above represent the state branch of the public administration for Ukrainian agriculture as a whole and the exports of agricultural products in particular. But even here it is very difficult to assess the effectiveness of their activity, that is the effectiveness

of the decisions they make. The most indicative method of the public administration effective-
ness assessment is the analysis of the dynamics of the economic indicators the researched insti-
tutions administer. In our case, let's analyse the agricultural product exports of Ukraine from
the year 2012 to the year 2020 included, presented in Figure 1.
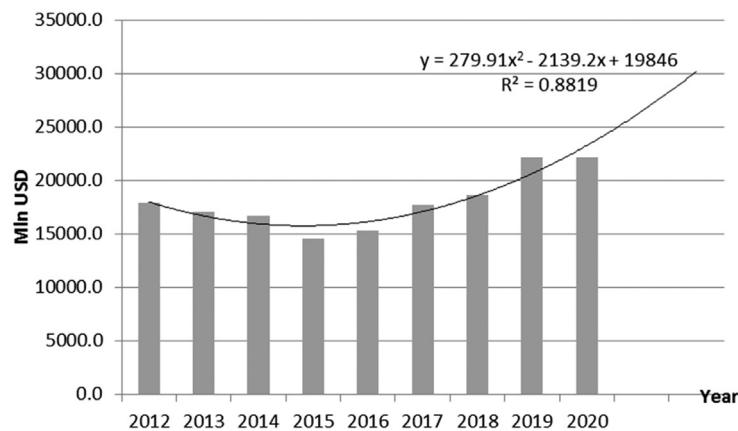
Figure 1. Exports of Agricultural Products of Ukraine, mln USD
Source: author's own elaboration on the basis of the data from the (SSSU, 2022(c))

Having cast a look at the figure given above, we see that the last year under research is 2020 –
the year, in which there was no evidence of any invasions or any other horrible events happen-
ing now in Ukraine. That is why the projection for the next two time periods, i.e. years, was
made only on the basis of evident data without taking into consideration the current war situ-
ation in the country. While observing the overall current situation with the Ukrainian agricul-
tural products exports we can call this projection an optimistic one, that is what the agricultural
products exports amount would be if there was no war in Ukraine. Coming back to the very dy-
namics of the agricultural products exports depicted in Figure 1, we can divide it into two parts
according to its direction – the first one (downward) from the beginning of the time frame un-
der analysis to the year 2015 included. The explanation for the said downward trend can be the
turbulences in the political life of the country. The second part, the upward one, last from the
year 2016 to the end of the analysed time frame. The upward tendency of the second dynam-
ics part continues to be of the kind during two more years taken for the projection as well. As
it was already stated, the projection can be called an optimistic one as it was made on the basis
of the data with the last one being 2020, that is without taking into account the changes in agri-
culture as a whole and the agro–exports, in particular, happened because of the horrible events
happening in Ukraine. Just to add, the smallest amount of agricultural product exports can be
observed in 2015, which can be explained by the starting phase of the DCFTA and the fact that
not all agricultural products have been brought in line with the EU norms by that time. The big-
gest amount of agricultural product exports can be seen in 2020, which is a very good and sad
indicator at the same time – it shows, that the positive trend continued and the Ukrainian agri-
cultural products exports had great potential before the war. The trend line for the data depicted
in Figure 1 was built using the polynomial function. The choice was made judging by the values
of the R^2 coefficients of the exponential, linear, logarithmic, polynomial and power functions.

The interdependence of the agricultural products exports with the number, employment rate and
well-being level of the rural population is widely spoken about in the literature and at different
conferences, round tables, etc. There is no single point of view about the said interdependence
existence, its positiveness/negativeness and its strength. It would be logical to assume, that the

bigger the agricultural exports amount - the bigger the rural population number. The logic is very simple – a bigger amount of agricultural production needs more people to produce it. And because the main amount of agricultural production is produced in rural areas, the assumption mentioned above seems to be quite logical.

The state part of the public administration of the rural territories development is represented by the Ministry for Communities and Territories Development of Ukraine. The Ministry is the central executive body, whose activities are directed and coordinated by the Cabinet of Ministers of Ukraine. The Ministry is the main body in the system of central executive bodies that ensures the formation and implementation of state regional policy, state policy in the field of local self-government development, territorial organization of government and administrative-territorial organization, state housing policy and policy in the field of settlements landscaping, etc. (Ministry for Communities and Territories Development of Ukraine, 2020). The dynamics of the rural population of Ukraine as the results analysis of the said Ministry activity for the time frame under analysis can be followed in Figure 2.

The trend equation shown on the chart: $y = 0.0189x^2 - 0.3909x + 14.769$, $R^2 = 0.9209$
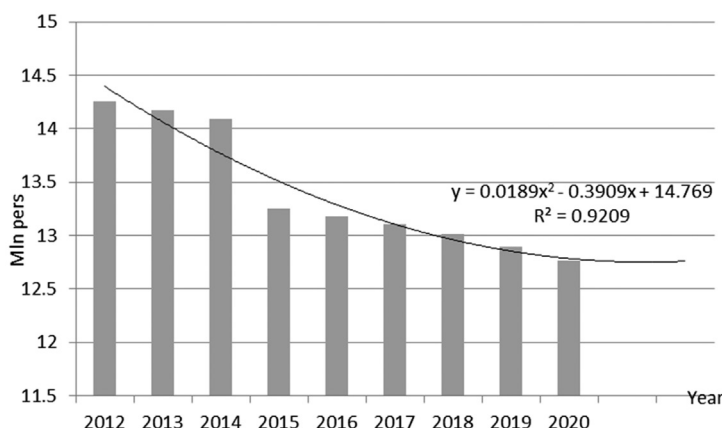
Figure 2. Rural Population of Ukraine, mln persons

Source: author's own elaboration on the basis of the data from the (SSSU, 2022(b))

As far as we can see in the figure given above, the rural population of Ukraine dynamics is downward throughout the whole time frame under analysis without any interruptions. Such a downward trend is very troublesome for the Ukrainian rural settlements, agriculture and the whole country as well. Of course, the decrease in the overall population of Ukraine should be taken into account while analysing the dynamics of the Ukrainian rural population as well, but, as it has already been stated, the overall downward tendency is a negative indicator both for agriculture and the economy of the country. Not only the rural population of Ukraine dynamic is downward through the whole time frame under analysis, it continues being of the kind during two periods taken for the projection making. The trend line for the rural population of Ukraine dynamics was built using the polynomial function, having chosen from the exponential, linear, logarithmic, polynomial and power functions. The criterion for the choice of the appropriate function was the values of the R^2 coefficients of the said functions.

Coming back to the statement expressed above about the logicality of the interdependence between agricultural products exports amount and the rural population number. The analysis of the data depicted in Figures 1 and 2 allows us to state that till the year 2016 there was a positive interdependence between the said data as we observed the decrease in agricultural products exports amount as well as the decrease of the rural population of Ukraine. After that, we observe

the opposite situation – the increase in the exports of agricultural products and the continuing decrease in the rural population number. In order to understand whether this is just a coincidence and there is/is no correlation between them, more profound research with the use of more robust statistical tools and software should be conducted, which is one of the further directions of the research presented here.

To make the research more profound, let's analyse the dynamics of the population of Ukraine (aged 15-70) employed in agriculture, forestry and fishing, as depicted in Figure 3.

Figure with bars for years 2012–2020 and trend line equation $y = 0.0116x^2 - 0.1797x + 3.5396$, $R^2 = 0.7193$. Y-axis labelled "Mln Pers", X-axis labelled "Year".
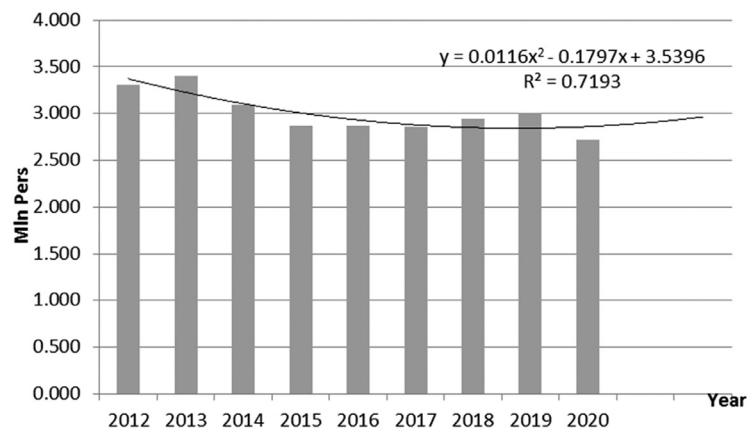
Figure 3. Population of Ukraine (aged 15-70) employed in Agriculture, Forestry and Fishing, mln persons

Source: author's own elaboration on the basis of the data from the (SSSU, 2022(a))

Unlike the dynamics of the rural population of Ukraine, the one for the population of Ukraine (aged 15-70) employed in agriculture, forestry and fishing is more changeable. There is no one clear trend in it. It increased in 2013 but decreased in the following year, having started the downward tendency which last to the year 2017 included. The tendency changed to the opposite one in 2018 but didn't last for too long and changed to the opposite one again as we observe the next decrease of the population of Ukraine employed in agriculture in 2020. The biggest number of people employed in agriculture was observed in 2013 and the smallest – in 2020. And the latter figure should be much thought about especially by the public officials of all levels. The overall trend is slightly downward approximately to the year 2019 starting an upward movement afterwards. Due to the trend line, the number of people employed in agriculture, forestry and fishery is about to increase during the two years taken for the projection. But the research was made without taking into account the war situation in Ukraine and the changes in all the spheres of the country's activity connected with it. That's why the said projection can be called an optimistic one. The trend line for the data presented in the figure given above was built with the help of the polynomial function, just like in two other cases presented earlier. The values of the R^2 coefficient of such functions as exponential, linear, logarithmic, polynomial and power- were taken as a criterion for the right choice of the appropriate function.

3. FUTURE RESEARCH DIRECTIONS

The exports of agricultural products from Ukraine have become one of the most topical matters in the whole world. The obstacles to the exporting of agricultural production from Ukraine, are those that the country-aggressor creates, blocking the seaports, and threatening the food security and food availability in many countries, especially those in Africa and Asia. In the current disruptive

times, the matter of the effective public administration of the exports of agricultural products is therefore important not only for Ukraine itself but for its trading partners as well. It is advisable to continue the research started in this paper taking into account the current data on the agricultural products exports of Ukraine to analyse the changes in the amount that occurred due to the war and the economic and political events caused by its influence. Judging by the results of the analysis mentioned in the previous sentence, optimization measures are to be developed to stabilize the agricultural products' amount increase and uninterrupted exporting functioning.

The results of the presented research show partially positive and partially negative interdependence of the agricultural products exports of Ukraine and the number of the rural population of Ukraine. In order to understand whether this is just a coincidence and there is/is no correlation between them, more profound research with the use of more robust statistical tools and software should be conducted, which is one of the further directions of the research presented here. The next direction of the given research would be to analyse the presence/absence of a correlation between the agricultural product exports of Ukraine and the number of people employed in agriculture and, in case of its presence, the strength of the said correlation.

4.   CONCLUSION

Agriculture is vitally important for the survival of the whole of mankind as it is the source of food for human beings, forage for animals and raw materials for the processing industry. To ensure food security for all the parts of the world the agricultural products trade comes into play. Therefore, the agricultural producers and exporters tend to gain more and more economic and political power and influence either in a definite region or on the world stage. That's why the effective public administration of the exports of agricultural products comes to be an absolute necessity for the successful functioning of agriculture in particular and the whole country's economy as a whole. The following statement has been expressed in the paper – for the production of a bigger amount of agricultural products for export one needs more workforce, that is more people living in rural areas and therefore more people employed in agriculture. The research analysis showed the first half of the data for the exports of agricultural products to be positively and the second half negatively interdependent with the number of rural population number of Ukraine. The number of people employed in agriculture seems not to be correlated with above mentioned analyzed data.

Drawing conclusions on the data analysed in the paper, one should state that the agricultural products exports of Ukraine can be divided into two parts according to their dynamics direction – the first one (downward) is from the beginning of the time frame under analysis to the year 2015 included and the second part, the upward one, last from the year 2016 to the end of the analysed time frame. The explanation of the downward trend of the first part of the analysed time frame can be the turbulences in the political life of the country. The upward trend of the agricultural products exports amount during the two years following 2020 can be called an optimistic projection as the analysed data don't include the actual ones of the year 2022. If judged by the results of the research, the public administration of the exports of agricultural products has been effective enough, at least during the time frame under analysis.

If we talk about the rural population of Ukraine dynamics, it is downward through the whole time frame under analysis without any interruptions. Such a downward trend is very troublesome for the Ukrainian rural settlements, agriculture and the whole country as well. That, in turn, means that the effectiveness of the public administration authorities is not high enough. The public administrative

authorities and administrators, especially from the state administrative bodies of power, should change the overall policy, making the living in the rural areas more attractive for people.

There is no one clear tendency in the dynamics for the population of Ukraine (aged 15-70) employed in agriculture, forestry and fishing as it is more changeable than those of the agricultural products export amount or the rural population of Ukraine. We don't consider one single factor to influence such instability of the number of people employed in agriculture. Together with the turbulences in the political and economic life of the country, the administrative-territorial reform had its impact as well as the changes in the institutional frame of the public administration of Ukrainian agriculture. The whole complex of the said factors plus the individual peculiarities of a single settlement/farm/company had their influence making the said data dynamics such changeable. Further research on the presence/absence of the correlation between the number of people employed in agriculture and the agricultural products exports of Ukraine would be of great interest, especially taking into account the inner country migration of the Ukrainian workforce caused by the war. The research and its results will be interesting and useful for public administration officials, companies' managers engaged in agriculture and international trade, decision-makers, academic community representatives as well as beginners and experienced data analysts.

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Is an Export-Led Growth Sustainable for Bulgaria?

Victor Yotzov[1]

Abstract: *The study considers the main economic growth models from the perspective of their relation to the external sector. It defines the advantages and drawbacks of the export-led model and the import-substitution model and sheds light on the growth constraints ensuing from the balance of payments and the elasticities of imports and exports. It analyses the prerequisites for selection of one or another growth model and comes to the conclusion that Bulgaria will have to implement an export-oriented growth model within a medium-term perspective. In this relation, it makes proposals aimed at improving the country's foreign trade policy.*

1. INTRODUCTION

Economic growth models have undergone a number of changes in the recent decades. Right after World War II, a prevailing part of developing countries adopted an economic development model based on the so-called import-substitution model. The rationale of this model was to encourage domestic production and development of an own economic base. Corresponding to this view, large part of the developing countries enforced (to a varying extent) protectionist policies and ardently protected their newly emerging production and industries. In spite of the timely warnings by economists of potential losses owing to the unreasonable distribution of resources, the generally accepted view was that the benefits from increasing production output and ensuring domestic employment compensated for the losses resulting from ineffective distribution. This model was widely used until mid-1970s, and later was gradually abandoned.

Approximately at the same time, the economic success started to stand out, first in Japan and later on in South Korea, Singapore, Taiwan, and Hong Kong, which all used an economic development model based on strong encouragement of exports. Soon after, the export-led growth (ELG) became the standard development practice and was widely imposed by the IMF in the Fund-supported programmes.

Empirical data, however, cannot fully confirm the assumption of the existence of any advantages of export-led growth over the import-substitution growth, as according to data of the United Nations Conference on Trade and Development (UNCTAD) it turns out that economic growth rates slowed down after 1980. The slowdown of economic growth continued as late as the end of 1990s, when the impact of the inclusion of China and India in the international division of labor started to be strongly felt, pulling up the whole group of developing economies. Even before the global financial crisis, there were signs of wearing out of the export-led growth paradigm. Japan was the first country to evidence drastically reduced growth rates in spite of the great volumes of its exports. Similar trends were also evidenced in other countries, mainly in Latin America, which renewed the interest in the limits of the ELG.

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2. COMPARING EXPORT-LED GROWTH TO DOMESTIC DEMAND-LED GROWTH

The rationale of the ELG lies in the ability of foreign trade to drive economic growth, in the sense that it facilitates the more effective distribution of resources within a single country, and between different countries and regions. Besides, exports are an effective tool for introducing new technologies and acquiring new knowledge, which (from the perspective of the endogenous theories) stimulates growth. In other words, growth of exports plays an important role in the overall process of economic growth, with its positive impact on both demand and accumulation of capital. Having achieved high export growth, import capabilities of an economy increase as well and thus further enhancing economic growth. The implementation of ELG models, on the other hand, can be viewed as a step back to the mercantilists' views, particularly in the context of the laissez-faire doctrine. There are numerous studies establishing strong correlation between export growth and economic growth. The advantages of ELG are well known and hardly deserve more attention.

ELG, however, has serious opponents (Palley T. , 2011), bringing to the fore some inherent deficiencies, the most important of which are:
- Developing of dependence on external demand by developed countries and increased volatility of growth;
- Slowdown of growth rates in the domestic market;
- Ferocious competition between the developing countries leading to "export displacement" and ultimately to deterioration in the conditions of trade for all exporters;
- Exacerbation of global imbalances and negative impact on financial stability;
- The more countries implement this strategy, the lower its effectiveness due to the constraints of global demand.

Because of these drawbacks, more and more supporters gather the view that the ELG is exhausted and has to be replaced with a domestic demand-led growth. One of the major arguments is that China's entry into the international markets has significantly changed the "rules of the game". ELG models are hierarchical and assume replacement of old players with new ones that offer lower costs per unit of output. Offering cheap, unpretentious and relatively well trained labor in China is practically unlimited, which places the other developing countries (both in the region and globally) in unequal position. There are already a number of examples – primarily in the light industry and more specifically in the production of knitwear – proving the assumption of "export displacement".

In spite of the existing shortcomings of the ELG, it is clear that the developing countries (at least at the early stage in their development) cannot succeed without relying on export industries. The question is in what context export stimulation is considered. From this point of view, international trade should be governed by the idea of economic development, rather than seeking at any cost comparative advantages in various activities and industries, as this often results in negative effects in the longer-term perspective.

3. SELECTING A GROWTH MODEL FOR BULGARIA

Political factors influencing the selection of a development model are of a great importance, if not even more important than the economic ones. Government authorities, with no exception, always want to see surpluses on the current account of the balance of payments (BOP), and are

concerned with having deficits, irrespective of their economic nature. This argument, no matter how trifling it may seem from economic point of view, very often turns to be decisive in making specific governance decisions. The reason lies in the believe that by pursuing an export-oriented policy (instead of stimulating domestic demand) can more easily ensure high employment without causing any inflationary pressure in terms of payment of labor. This, however, presupposes (since trade globally is balanced by definition), that for each country implementing such a mercantilist approach to the trade balance, there should be a country(s) that is/are ready to carry the burden of a trade deficit and to import inflation (deflation).

The issue actually boils down to the question why many countries consider trade balance surpluses as a stronger instrument for increasing revenues, than domestic investments? The explanations that are usually offered are along two lines: first, trade surpluses to a great extent solve the problems with effective (unlimited by other markets) demand, and second, from the perspective of national accounting, the external account surpluses can be presented as external investments, which subsequently have a multiplication effect both on production and on employment. The logic here is: any increase of domestic economic activity leads to an increase in imports, thus any income and employment increase as a result of internal factors should be at least partially compensated by a decrease of external investments. On its part, any increase in trade surpluses due to increased exports does not lead to a decrease in domestic investments, but rather creates conditions for their increase, provided external demand remains stable.

Comparing and analyzing the two alternative models is useful as it outlines the differences and offers possibilities to choose depending on specific conditions. There is another approach, however, to analyzing export-led models, which is based on a more in-depth analysis of the BOP. The underlying idea here is that the condition of the BOP (in the context of an open economy) is a natural constraint of growth. Traditional theories of economic growth usually ignore the BOP and exclude monetary impacts. These models are demand-led and assign an auxiliary role to the BOP, assuming that it is self-equilibrating through the mechanism of domestic and/or external price adjustments. Thus, the relation is lost between the condition of the BOP and the accumulation of resources in support of economic growth.

The Keynesian approach puts the emphasis on demand, proceeding from the assumption that supply adapts to demand and not the other way round. From this perspective, economic growth should not simply be considered as constrained by supply. This, of course, does not mean that there are no such constraints, but that they are not the determining ones. This approach is based on the understanding that normally the supply of labor in developing countries is more than sufficient, but there is no capital (or it's insufficient), which can be provided by imports, for which foreign currency is needed. The economically most advantageous and sustainable manner of providing the required financial resources is by stimulating exports, which ensure import of capital in the conditions of maximum employment. This is what ensures stable economic growth in the long-term. If exports cannot provide the necessary funds for imports, incomes will start decreasing, which will cause a decline in the rate of imports and equilibration with the volume of exports. In other words, the equilibration of the external sector would come as a result of adjustment of incomes. The trivial conclusion regarding the economic policy is that if the economy develops below the levels of productive potential (i.e. when the constraints placed by supply are not of determining nature), then the economic growth rates will be determined by demand. From this point of view, the differing rates of economic growth between different countries are explained with the differences of aggregate demand. Therefore, the question boils

down to: what constrains the implementation of an active economic policy (both fiscal and monetary) in an open economy, and could/should Bulgaria use this approach?

Until recently, the understanding that demand cannot be uncontrollably stimulated due to the constraints imposed by the budget deficit and interest rate level was accepted as self-evident. Theoretical and empirical research, however, in the recent years increasingly drew the attention to the BOP as the main growth curbing factor. The main idea of this approach is that the international financial markets' assessment of the external position of a country limits its economic growth to levels below the constraints set by employment and production capacity utilization. The arguments are as follows:
- BOP problems are relatively quickly passed over to the real sector;
- Sustainable economic growth cannot be maintained without sustainable BOP, as financing the increasing deficits leads to increase in interest rates, which is acceptable only within a short-term horizon;
- High interest rates shift investors' interest to financial assets, which results in a reduction of investments in real assets, thus lowering growth rates.

The mechanism of implementing BOP constraints is relatively simple. If an economy starts facing BOP problems as a result of increased domestic demand (i.e. before reaching the short-term production capacity), aggregate demand shrinks, and aggregate supply is not used to its full extent. When this happens, investments decrease, thus directly impacting factor productivity, respectively growth. On the other hand, if an economy can increase its aggregate domestic demand to the level of the existing production capacity (i.e. without accumulating external sector imbalances), the pressure exerted by the demand will have a positive impact on production capacity, and from there on economic growth. Practice has proven this is possible under certain conditions, the most important being:
- Investments should be channeled into the tradable sector;
- Production factors are distributed with priority to the sectors with higher productivity;

Actually, the above conditions are the essence of the export-oriented growth model, in which growth of exports results in increased economic growth rates without any deterioration of the international investment position of the economy. However, it should be immediately underscored that one and the same rate of exports growth will not have similar consequences in different countries. This is so due to the fact that different countries have different sensitivity of growth rates to imports – equilibrium growth from a BOP point of view will be reached on different levels in the growth rates of aggregate demand. The pioneering research in this area was made by (McCombie & Thirlwall, 1994), who proved that from the BOP perspective equilibrium growth Yb is set according to the simple rule: $Y_b = z \cdot \varepsilon / \mu$, also known as the Thirlwall law, where z is the growth rate of global production (income), and ε / μ is the ratio between the income elasticities, respectively of exports (ε) and imports (μ). If we assume that global production (income) increases at regular rates, then the equilibrium (sustainable) growth of an economy is determined by the ratio of elasticities of exports and imports.

It is important to note that the effect of any changes in the exchange rate is eliminated in deriving this rule (law), as it is assumed that these changes do not impact volumes significantly. Empirical data unequivocally prove that the devaluation of the national currency can bring a short-lived improvement in the BOP, but this does not always impact growth rates positively, because the nominal devaluation rarely grows into real devaluation due to the strong inflationary effects

it generates. This is also confirmed by the recent years' observations, showing that changes in the real effective exchange rate have a negligibly low relation to volumes of trade flows.

Having said all this, a conclusion can be made that different economies grow at different rates because domestic demand grows at different rates, which, on its part, is constrained by the requirements of balance of payments equilibrium, in the sense of the Thirlwall law. Hence, the issue comes down to explaining why the constraints imposed by the BOP are different in different countries, i.e. why elasticities of exports and imports differ. It is not easy to answer this question as it requires an additional analysis, which goes beyond the scope of this study. It can be mentioned, however, that the elasticity of exports (imports) reflects to a very great extent the differences in the so-called "non-price competition". The significance of this conclusion can hardly be overestimated. It turns out that supply is important only as much as the supply of production factors (investments in new technologies, R&D, education, etc.) can influence the elasticity of demand for exports which, on its part, is of crucial importance for the growth rate of exports, and from there for economic growth. This approach differs considerably from the classical interpretation of supply, where the very growth of factors (labor, capital and technologies) explains economic growth by itself.

Clarifying the theoretical concepts as regards the possible types of economic growth and the constraints they impose are important from the perspective of formulating of a specific economic policy for Bulgaria. The issue that is most important is whether the economy can generate sufficiently high growth based on internal factors, so that it won't need to rely on the vicissitudes of external markets? Furthermore, a possible positive answer to this question requires an answer to another one – what the role of the government in pursuing such a policy?

No matter how convincing the arguments of the adversaries of export-led growth might sound, the truth is that incomes in Bulgaria are low and will remain at low levels in the medium-term, which does not allow making full use of the domestic demand-led growth mechanism. The constraints set by the currency board arrangement and the impossibility (at least in the medium-term) to pursue an expansionist fiscal policy are additional factors in support of the conclusion that in the foreseeable future Bulgaria will have to rely primarily on its exports for ensuring economic growth, based on economy of scale. From the point of view of the constraints imposed by the balance of payments, the message is clear – increasing the pace of economic growth is possible only if Bulgarian exports are made more attractive and/or the elasticity of imports is reduced (in the best-case scenario a combination of both). Otherwise, i.e. if production capacity is growing at a quicker rate than domestic demand (due to the constraints imposed by the balance of payments) unemployment will increase, which will further reduce consumption. In other words – it is not just a question of ensuring economic growth by more exports, but by the export of the right goods and services, those for which there is elastic demand.

4.   CONCLUSION

Drawing on all said so far, one can convincingly affirm that export-led growth means not just high rates of exports but is related first and foremost to providing all necessary conditions for improving the effectiveness of exports in a manner that makes them a driver of economic growth. Implementing this seemingly simple idea requires providing a number of prerequisites. Economic growth rates will be related to the growth of export volumes only after the strategic export industries for the economy have been determined. This is the only way to get

rid of sporadic and campaign-driven measures for stimulating individual productions and for achieving short-term effects on the BOP current account, and to develop a purposeful policy of long-term effects on the overall economic development. From this perspective, the policy of export-led growth should not be based on an individual successful trade breakthrough, but rather on a comprehensive strategy for identifying, developing and establishing market positions. One of the main difficulties to be overcome in case of an export-oriented trade policy is related to the restructuring of import and export nomenclatures, but this is an issue that goes beyond the scope of this study. And last but not least, the various forms that an export-oriented policy can take are determined by both the nature and specifics of the economy and by the existing connections and relations between the government and the business – an issue that has not yet found any acceptable solution.

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Relationship between Exchange Rate and Trade Balance Pre and after COVID-19 – Albania Case Study

Nevila Mehmetaj[1]

Abstract: *This study attempts to identify the relationship between the real exchange rate and trade balance in Albania with its major trading partner Italy. Due to the severe lockdown and restrictions policies in response to Covid-19 measures, there were important effects on the evolution of trade. Quarterly data from 2008 to 2022 are used in several econometric methods such as unit root tests, cointegration techniques, Granger test, and vector error correction model (VECM). The main findings of this study are that domestic income and exchange rate show a long-run positive relationship to the trade balances. Devaluation of the domestic currency will improve the trade balance in the long run, consistent with the Marshall-Lerner condition.*

1. INTRODUCTION

Albania has been a member of the WTO since September 2000 and pursued a transparent, and liberal trade policy. The country's trade policies were based in absence of taxes on exports or quantitative restrictions on export levels. The country implemented several free trade agreements and benefited from preferential tariffs with some European countries, CEFTA countries, EFTA countries and Turkey. The "Open Balkan" initiative is the newest interstate agreement of broader regional cooperation launched by Balkan countries aspiring to be later in the European Union. The memorandum agreements were signed initially between Albania, North Macedonia, and Serbia, and were designated to facilitate the free movement of goods, free access to the labor market, free movement of people, etc. The commitment initiative of creating functional common markets seems to offer more in-depth integration of intraregional economic and societal connections.

Despite facilities on trade agreements, the measures taken by the Albanian government toward COVID-19 had serious consequences for the national economy. Many productive activities have been disrupted as a result of border closures and severe restrictions on business activities. This has consequences in a steep rise in unemployment rates of all age groups with a consequent reduction in demand for goods and services. Against this backdrop, country gross domestic product (GDP) had a sharp decline during the 2020-s, registering its sharpest contraction since the changes in the political system in the 1990s, and the fall of the pyramidal schemes in 1997. In this context, the volume of national trade reached its lowest levels. In May 2020 the level of exports decreased by 22.7 % while the level of imports decreased by 24.2 % compared to the same period of the previous year (Instat, International Trade Statistics in Years, 2022). In January 2021 the value of exports was 24 billion ALL (increase of 3.1 % compared to January 2020), while the value of imports was 45 billion ALL (increase of 8.4 % compared to January 2020). In January 2022, the value of exports was ALL 35 billion (increase of 47.5 % compared with the same period of the previous year), while the value of imports was ALL 55 billion (increase of 21.1 % compared with the same period of previous year) (Instat, International Trade Statistics in Years, 2022).

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Development of the country's foreign trade has been characterized by increasing trade flows, a fact that indicates an opening and intensification of trade exchanges with the world economies and markets. However, the country had a negative trade account balance associated with higher levels of imports compared to the level of exports. Albania's current account deficit has had continuous fluctuations during the last two decades (see figure 1).
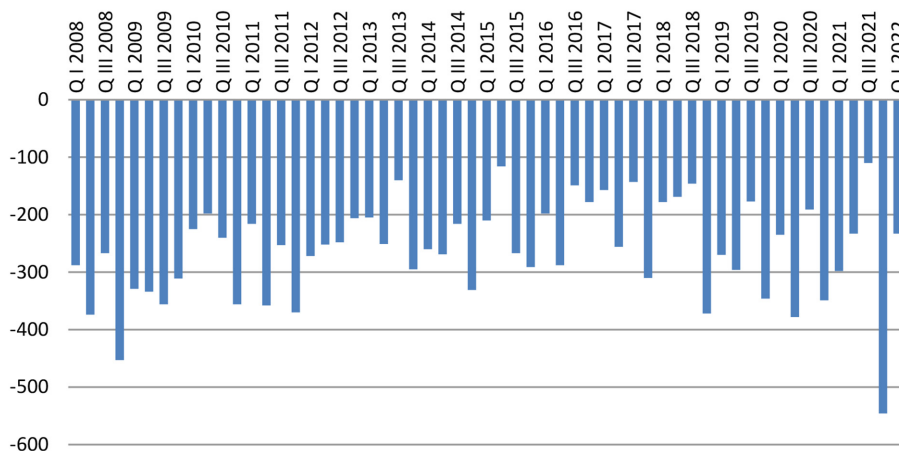
Figure 1. Current Account on a Quarterly Basis, 2008-2022 (in million Euros)

Source: Bank of Albania, Statistics, Time Series, External Sector, Balance of Payments, accessed 22nd June 2022. (BOA, Statistics, Time Series, Balance of Payments, 2022)

The import of goods composes a critical part of the current account deficit, while the positive values of the service sectors as tourism, financial sector, mining sector, etc., contribute to the decrease of the net trade deficit position.
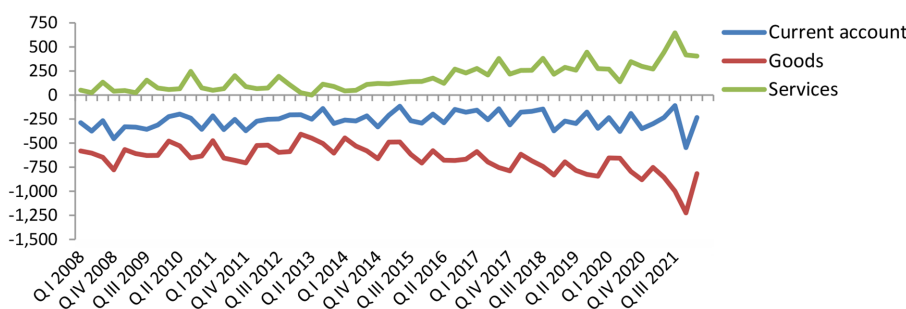
Figure 2. Balance of Payments of Goods and Services, on a quarterly basis, 2008-2022 (in million Euros)

Source: Bank of Albania, Statistics, Time Series, External Sector, Balance of Payments, accessed 22nd June 2022.

The country's most important trading partners are the European Union (67.8%, of which Italy has the largest share), CEFTA countries (8.6%), Turkey (5.9%), China (6.2%), the United States of America (1.5%), EFTA countries (1.2%), and other world countries. Due to the geographical vicinity, Italy stands as the most important trading partner of Albania, with which the outflux of exports reached 1.3 billion Euro and influx of imports reached 1.6 billion Euros in 2021 (see figures 3 and 4).

The trade with Italy has been in continuous fluctuations, especially during the pandemic period. The trade balance most of the time has been negative, except in 2016 and 2022 when the level

of exports surpassed the level of imports. This is due mostly to the increase in exports of many Italian firms that operate in Albania.
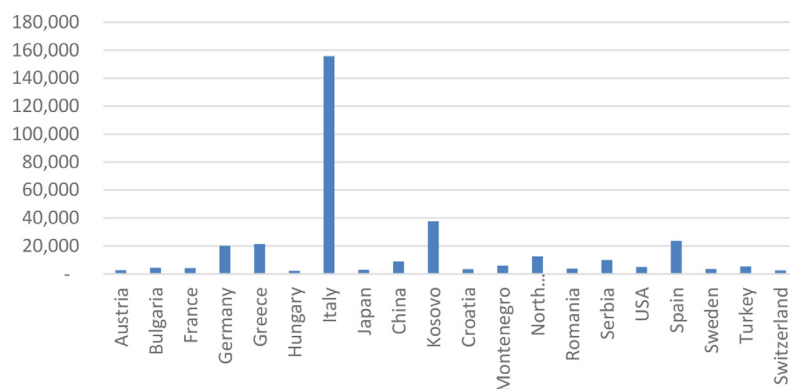
Figure 3. Export of Albania by Trading Partner Countries in 2021 (million ALL)
Source: Institute of Statistics, International Trade Database
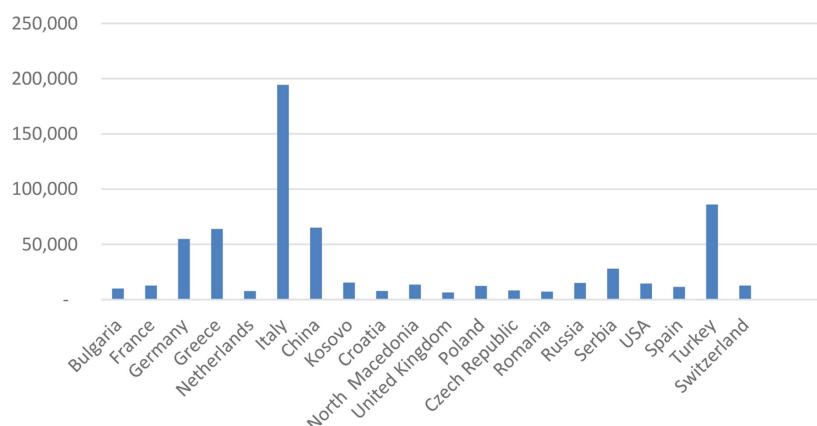
Figure 4. Import of Albania by Trading Partner Countries in 2021
Source: Institute of Statistics, International Trade Database
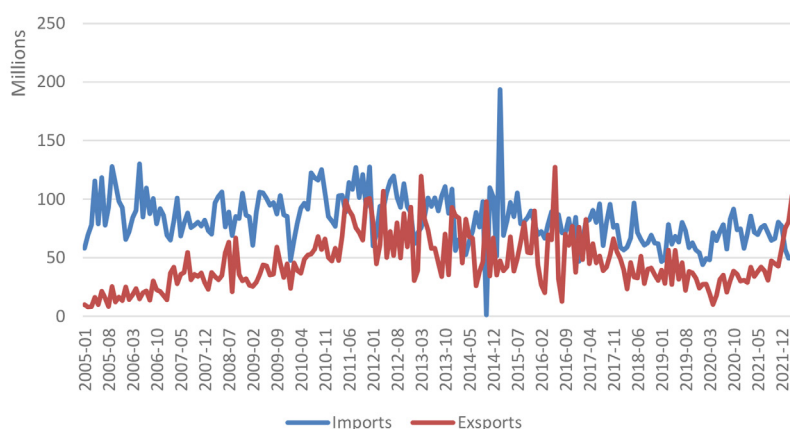
Figure 5. Imports and Exports of Albania and Italy, 2005-2022
Source: Institute of Statistics, International Trade Database

The dominating trade currency with European partner countries is Euro (while with other world partner countries the Us dollar), which has been fluctuating against Albania's ALL currency. Over the years, this has had an important effect on the outcome of the balance of trade.
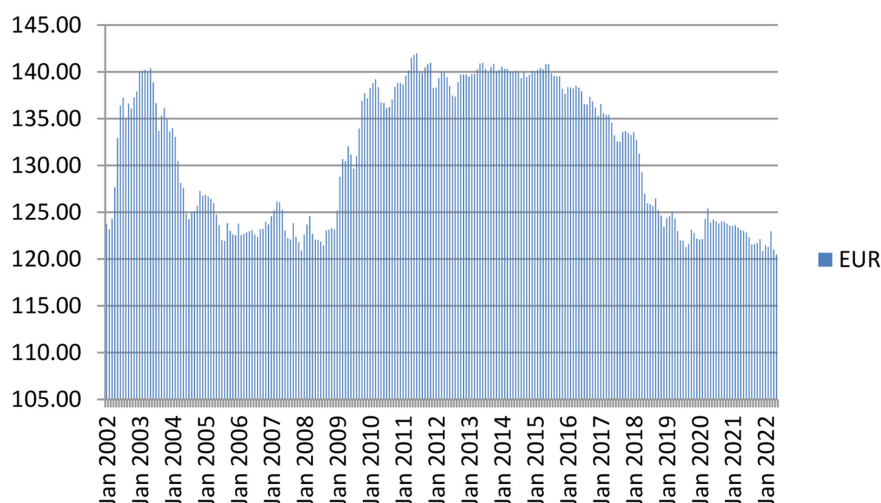
Figure 6. Exchange Rates, Eur/All in Albania, 2002-2022

Source: Bank of Albania, Statistics, Time Series, External Sector, Exchange Rates, accessed 22 June 2022.

Therefore, it is the objective of this study to analyze the effects of Covid-19 on the evolution of exchange rates and the fluctuations of Albanian trade balance in relationship to its major trade partner country Italy.

2. LITERATURE REVIEW

Depreciation of the currency has a great effect on the trade balance of a country, nevertheless its effect may also vary due to the different intensity of economic development. This phenomenon is described as the Marshall-Lerner condition, which denotes that domestic currency depreciation leads to increase in the trade balance in the long run. Real currency depreciation improves the trade balance through two channels. First, as import is relatively more expensive, quantity of imports decreases. Second, depreciation of the currency exposes the domestic goods cheaper compared to foreign goods, thus increasing the quantity of export making domestic product more competitive. However, the response of trade volumes (exports and imports) to currency depreciation will not occur rapidly. The theory of international trade suggests that exchange rate depreciation will initially not affect or deteriorate trade balance in the short run. This is because of the following reasons: "products in transit do not react to changes in exchange rate, because have already been priced according to the old exchange rates" (Krueger, 1983). This scenario is known as J-curve effect and gets the name of the J-shape of trade balance (Magee, 1973).

Rose (1991) described that the Marshall-Lerner condition does not exist in five major OECD countries (Germany, United Kingdom, United States, Canada, and Japan). Her study results showed no significant relationship between exchange rate and trade balance, implying that domestic currency devaluation could not enhance trade balance in the long run (Rose, 1991). Other results were presented by Shirvani and Wilbratte whose results provided significant evidence for the Marshall-Lerner condition. The authors examined the relationship between trade balance and real exchange rate in the United States and the G7 countries of Italy, Germany, France, Japan, United Kingdom, Canada and the United States (Shirvani & Wilbratte, 1997).

The relationship between trade balance and exchange rate evolution was presented by many authors in different countries (Ling, Har, & Mei, 2008). Many studies using bilateral trade data

contributed to the literature examining the effect of the COVID-19 pandemic on countries' aggregate trade flows. China's lockdown policies resulted in a decrease in the trade responses to the partner countries with the reduction of capital goods (Liu, Emanuel , & Huimin , 2021). Similarly, using bilateral trade data from about 30 countries, they found that lockdowns had a diminishing effect on bilateral trade flows. Espitia et al. recognized considerable heterogeneity of lockdown effects across trade sectors (Espitia, Aaditya , Rocha, Ruta, & Winkler, 2021).

3.   METHODOLOGY

The modeling of the trade balance of this study follows the similar model presented by Gomez and Alvarez-Ude (2006). Equilibrium of goods market in an open economy can be presented as:

$$Y = C\,(Y - T) + I\,(Y,\,r) + G - IM\,(Y,\,\varepsilon) + X\,(Y^*,\,\varepsilon)$$

where Y denotes total domestic income, C denotes consumer spending, and T denotes income tax, I denotes private investment, r the interest rate, G denotes government spending, ε denotes real exchange rate, IM denotes import, X denotes export, and Y^* denotes foreign income.

Consumers spending *(C)* is a positive function of the disposal income *(Y-T)*; higher disposal income lead to higher consumer spending. Private investment *(I)* is a positive function of total income and negative function of interest rate. The real exchange rate is a positive function of the nominal exchange rate (E) and the foreign price level (P^*), while the negative function of the domestic price level is:

$$\varepsilon = (EP^*)\,/\,P \tag{1}$$

Import *(IM)* is influenced positively by domestic output or income (Y). Additionally, import has a negative relationship with the real exchange rate *(ε)*; higher *(ε)* leads to a lower quantity of imports because of the higher price of foreign goods. Export (X) exposes a positive relationship between the foreign income *(Y*)* and the real exchange rate *(ε)*.

As the objective of the study is to examine (net export, NX) and exchange rate, other variables are assumed 'ceteris paribus'. The net export is:

$$NX \equiv X - IM \tag{2}$$

or after some mathematical substitutions:

$$NX \equiv X\,(Y^*,\,\varepsilon) - IM\,(Y,\,\varepsilon) \tag{3}$$

$$NX = X\!\left(Y^*,\,\frac{EP^*}{P}\right) - IM\!\left(Y,\,\frac{EP^*}{P}\right) \tag{4}$$

assuming, that EP*/P is stationary:

$$NX = NX\,(Y,\,Y^*,\,\varepsilon) \tag{5}$$

Therefore, the trade balance as a function of the domestic and foreign income and the real exchange rate is presented as:

$$\ln TBt = β0 + β1\ln Yt + β2\ln Yt + β3\ln RERt + μt \tag{6}$$

where the *B-s* are the estimators in the model, *ln* is the natural logarithm, u_t is the white-noise process, *TBt* is the trade balance as the difference of exports to imports in the logarithm form, and real exchange rate, *RERt*, expresses by Albanian (All) against Euro and Y^*t expresses as gross domestic product of Italy. The quarterly data of Albania used in the model are obtained from the Institute of Statistics, and Bank of Albania; and quarterly data of Italy are obtained from Eurostat (Eurostat, National Accounts, GDP aggregates, 2022). Time series variables data as exchange rates Euro/All, net exports between countries, gross domestic incomes, gross foreign incomes, and consumer price index (CPI) for both countries are used for the period from 2008 to the first quarter of 2022 (Eurostat, Real effective exchange rate (42 trading partners, based on HICP/CPI), 2022). Augmented Dickey-Fuller (ADF) test is used to test the data for stationarity. The Granger causality test is used to test the data for cointegration. The vector error correction model (VECM) is used to analyze the short-run (dynamic) and the long-run (static) relationships between trade balance, real exchange rate, and domestic and foreign income.

4. RESULTS

The results of the Augmented Dickey-Fuller test show that *Δln TB, Δln RER, Δln Y and Δln Y** are integrated in order at level I (1); while *ln TB* is stationary in level form, I (0).

Table 1. Unit Root Test

Variables	Estimated coefficients	Variables	Estimated coefficients
ln TB	-3.332* (0.034)	*Δln TB*	-2.855** (0.0451)
ln RER	-0.654 (0.758)	*Δln RER*	-6.258** (0.003)
ln Y	0.452 (0.879)	*Δln Y*	-3.236** (0.001)
ln Y*	-1.474 (0.547)	*Δln Y**	-2.158** (0.005)

Note: *, **significance level at the 5% and 1%

Source: Author's calculations

The Engle-Granger long-run cointegration test the multivariate system to check if any linear combinations exist between the four variables. In result, u_t -the error term in the long run is stationary in level form, *I* (0), table 2. This means a linear combination between *ln TB, ln RER, ln Y* and *ln Y** exists, or a long-run relationship between the variables in the model.

Table 2. Granger Test

Variables	ADF statistic	Probability
μ	-2.568	*0.002*

Source: Author's calculations

The result of pairwise Granger causality presents unidirectional Granger causality effects running from the real exchange rate to the trade balance (at 10 percent level of significance), from the domestic income to the trade balance (significant at 1 percent level of significance), and from the foreign income of European countries to the trade balance (at 5 percent level of significance).

Table 3. Pairwise Granger Causality Based on Vector Error Correction

x^2-statistics	Δ lnTB	Δ lnRER	Δ lnY	Δ lnY*
Δ lnTB	-	2.31 (0.06) *	11.29 (0.00) ***	4.23 (0.015) **

Source: Author's calculations

Cointegration results show that r > 0, at 1 percent significance level (see table 4), which means a long-run relationship exists between the variables in the model. The positive sign on the real exchange rate (*RER*) variable represents that a devaluation of currency causes an improvement in trade balance in the long run (see table 5).

Table 4. Johansen Cointegration Test

H0	H1	Trace statistic
r ≤ 0	r > 0	*48.258***
r ≤ 1	r > 1	*16.254*

Note: *, ** rejection of H0

Source: Author's calculations

Table 5. Johansen Cointegrated Vectors Estimation

	ln TB	*ln RER*	*ln Y*	*ln Y**
All/Euro	-1.000	0.057	0.089	-0.132

Source: Author's calculations

The results of error correction model used for estimation in the long run relationship between the variables are estimated:

$$\Delta lnTB_t = -0.0129 + 0.142\Delta lnTB_{t-1} + 0.217\Delta lnRER_{t-1} - 0.422\Delta lnY^*_{t-1} + 1.631\Delta lnY_{t-1} - 0.423\mu_{t-1}$$

The positive sign of the trade balance of the previous period, the real exchange rate, and gross domestic income show a positive relation of these variables to the trade balance, while foreign income shows a negative relationship to the trade balance in the long run. This is contradictory to the theory that suggests the sign of the foreign income (*Y**) to domestic trade balance should be positive. When the real income of the trading partners increases, the volume of exports to a foreign country should increase as the purchasing power is increased.

5. CONCLUSION

To test whether Marshall-Lerner condition and J-curve effects exist, after the impact of Covid-19 on the economy, this research studied the short run and long run effects of the real exchange rate of the trade balance of Albania with Italy, the major trade partner in international trade. A VECM dynamic model is presented for the short and long run effects between the variables. The study results do not show evidence of the short-term deterioration of trade balance suggested by the J-curve effects. However, the results support the empirical validity of the Marshall-Lerner condition, suggesting that depreciation improves the trade balance. As implication, to achieve the desired level of trade balance, the country should depend on devaluation nominal exchange rates based policies, which should be harmonized with domestic price level stabilization policies. However, this should be performed with precautions because devaluation-based policies could cause increase in the cost of imports.

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A Nonlinear Inflation Growth Model

Vesna Jablanovic[1] (iD)

Abstract: *In the short run, the fall in aggregate demand leads to falling output and price level and rising unemployment. In this sense, it is important to use the Phillips curve, i.e., the curve that shows the short-run relationship between inflation and unemployment. This paper creates a relatively simple chaotic inflation rate growth model. Also, this paper examines the inflation rate growth stability in the period 2000-2021 in France, and confirms the existence of the convergent fluctuations of the inflation rate in France in the observed period.*

1. INTRODUCTION

Eser, F., Karadi, P., Lane, P.R., Moretti, L., & C. Osbat (2020) explain the Phillips Curve in the formulation of monetary policy at the ECB. They use the structural Phillips Curve, and identify the slope of the structural Phillips Curve by exploiting cross-country variation and by using monetary policy surprises. Also, they present the role of inflation expectations. They conclude that inflation expectations remain central to successful inflation stabilization.

Del Negro, M., Lenza, M., Primiceri, G.E., and A. Tambalotti. (2020) explain the origins of this disconnect between inflation and economic activity. Namely, the unemployment rate has fallen, but U.S. inflation hasn't responded to this steep drop in joblessness. They conclude that unemployment needs to get lower to bring inflation back to target after a recession. They use an econometric model to explore how monetary policy should adapt.

Coibion, O., Gorodnichenko, Y., & Ulate, M., (2019) show surveys of household or firm expectations for 18 countries to estimate an expectations-augmented Phillips curve. They find strong evidence of a Phillips curve relationship: the Phillips curve is alive and well.

Passamani, G., Sardone, A. & Tamborini, R. (2022) create the Phillips Curve model, in which expected inflation, instead of being treated as an exogenous explanatory variable of actual inflation, is endogenized. This model is tested with the Euro-Zone data 1999–2019 and explains the "inflation puzzles".

Gordon, R.J., (2013) shows that he greatest failure in the history of the PC occurred not within the past five years but rather in the mid-1970s, when the predicted negative relation between inflation and unemployment turned out to be utterly wrong. Instead, inflation exhibited a strong positive correlation with unemployment. The model's simulation success is furthered here by recognizing the greater impact on inflation of short-run unemployment (spells of 26 weeks or

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less) than of long-run unemployment. The implied NAIRU for the total unemployment rate has risen since 2007 from 4.8 to 6.5 percent, raising new challenges for the Fed's ability to carry out its dual mandate

The negative short-run relationship between the rate of inflation and the unemployment rate was developed by A. W. Phillips (1958). Further, Samuelson and Solow (1960) showed a similar inverse correlation between inflation and unemployment in data for the United States. Milton Friedman (1968) argued that monetary policy can pick a short-run combination of inflation and unemployment on the Phillips curve. Edmond Phelps (1957, 1967.1968) also denied the existence of long-run trade-off between inflation and unemployment. Their views imply that a long-run Phillips curve is vertical.

This paper uses logistic mapping as an interesting tool of chaos theory. Chaos theory has been applied in economics by Benhabib and Day (1981,1982), Day (1982, 1983), Grandmont (1985), Goodwin (1990), Medio (1993), Lorenz (1993), Jablanovic (2016), Klioutchnikov, I., Molchanova, O., Klyuchnikov, O. (2017), Puu, T. (2003), Zhang W.B. (2012), etc.

2. THE MODEL

The chaotic inflation growth model is presented as:

$$u_t - u^n = -\alpha(\Pi_t - \Pi^e) \quad \alpha > 0 \tag{1}$$

$$u^n = \beta u_t \quad \beta > 0 \tag{2}$$

$$\Pi^e = \gamma \Pi_t \quad \gamma > 0 \tag{3}$$

Π – actual inflation, Π^e – expected inflation, u – the unemployment rate, u_n – the natural rate of unemployment, α is a parameter which shows the responsiveness of unemployment to inflation; β is a parameter which shows the responsiveness of u the natural rate of unemployment to the current unemployment rate; γ is a parameter which shows the responsiveness of the expected rate of inflation to the current rate of inflation.

(1) shows the short-run Phillips curve; α is a parameter that shows the responsiveness of unemployment to inflation; (2) shows the natural rate of unemployment; (3) shows the expected rate of inflation.

According to (1)-(3), it is obtained that:

$$u_t = \Pi_t \left[\frac{\alpha(\gamma - 1)}{1 - \beta} \right] \tag{4}$$

Where Π- actual inflation, u – the unemployment rate, α is a parameter that shows the responsiveness of unemployment to inflation; β is a parameter that shows the responsiveness of u the natural rate of unemployment to the current unemployment rate; γ is a parameter which shows the responsiveness of the expected rate of inflation to the current rate of inflation.

Further, it is postulated that the growth rate of the unemployment rate at time t should be proportional to 1 - u_t (the fraction of the labor force that is not used up by the unemployment at time t). After introducing a suitable parameter δ, we obtain:

$$\frac{u_{t+1} - u_t}{u_t} = \delta\,(1 - u_t) \tag{5}$$

Solving the last equation (5) yields the unemployment rate growth model, i.e.,

$$u_{t+1} = (1+\delta)\,u_t - \delta\,u_t^2 \tag{6}$$

Now, putting (1)-(6) together we immediately get:

$$\Pi_{t+1} = (1+\delta)\Pi_t - \left[\frac{\alpha\,\delta\,(\gamma-1)}{1-\beta}\right]\Pi_t^2 \tag{7}$$

This model given by equation (7) is called the logistic model. Lorenz (1963) discovered the lack of predictability in deterministic systems.

Further, it is assumed that the current value of the inflation rate is restricted by its maximal value in its time series. We introduce π as $\pi = \Pi / \Pi^m$. Thus π range between 0 and 1. Again we index π by t, i.e., write π_t to refer to the size at time steps t = 0,1,2,3, ... Now growth rate of the inflation rate is measured as:

$$\pi_{t+1} = (1+\delta)\pi_t - \left[\frac{\alpha\,\delta\,(\gamma-1)}{1-\beta}\right]\pi_t^2 \tag{8}$$

This model given by equation (8) is called the logistic model.

3.   THE LOGISTIC MAP

It is possible to show that iteration process for the logistic map:

$$z_{t+1} = \mu\,z_t\,(1 - z_t)\,,\ \mu \in [\,0\,,4\,]\,,\ z_t \in [\,0\,,1\,] \tag{9}$$

is equivalent to the iteration of growth model (8) when we use the identification:

$$z_t = \left[\frac{\alpha\,\delta\,(\gamma-1)}{(1+\delta)(1-\beta)}\right]\pi_t\ \text{and}\ \mu = (1+\delta) \tag{10}$$

Using (8) and (10) we obtain:

$$z_{t+1} = \left[\frac{\alpha\,\delta\,(\gamma-1)}{(1+\delta)(1-\beta)}\right]\pi_{t+1} = \left[\frac{\alpha\,\delta\,(\gamma-1)}{(1+\delta)(1-\beta)}\right]\left\{(1+\delta)\pi_t - \left[\frac{\alpha\,\delta\,(\gamma-1)}{1-\beta}\right]\pi_t^2\right\} =$$

$$= \left[\frac{\alpha\,\delta\,(\gamma-1)}{(1-\beta)}\right]\pi_t - \left[\frac{\alpha^2\,\delta^2\,(\gamma-1)^2}{(1+\delta)(1-\beta)^2}\right]\pi_t^2$$

On the other hand, using (9) and (10) we obtain:

$$z_{t+1} = \mu\, z_t (1 - z_t) = (1+\delta)\left[\frac{\alpha\,\delta\,(\gamma-1)}{(1+\delta)(1-\beta)}\right]\pi_t \left\{1-\left[\frac{\alpha\,\delta\,(\gamma-1)}{(1+\delta)(1-\beta)}\right]\pi_t\right\} =$$

$$=\left[\frac{\alpha\,\delta\,(\gamma-1)}{(1-\beta)}\right]\pi_t - \left[\frac{\alpha^2\,\delta^2\,(\gamma-1)^2}{(1+\delta)(1-\beta)^2}\right]\pi_t^{\,2}$$

Thus we have that iterating (8) is really the same as iterating (9) using (10). It is important because the dynamic properties of the logistic equation (9) have been widely analyzed (Li and Yorke (1975), May (1976)).

4. EMPIRICAL EVIDENCE

This paper creates a simple chaotic inflation growth model and confirms the existence of the convergent fluctuations of the inflation rate in France in the observed period. In this sense,

$$\pi_{t+1} = \mu\,\pi_t - \omega\,\pi_t^{\,2} \qquad \mu, \omega > 0 \tag{11}$$

where π - the inflation rate , $\mu = (1 + \delta)$ and $\omega = [\alpha\,\delta\,(\gamma - 1)] / (1 - \beta)$; α is a parameter which shows the responsiveness of unemployment to inflation ; β is a parameter which shows the responsiveness of u the natural rate of unemployment to the current unemployment rate; γ is a parameter which shows the responsiveness of the expected rate of inflation to the current rate of inflation.
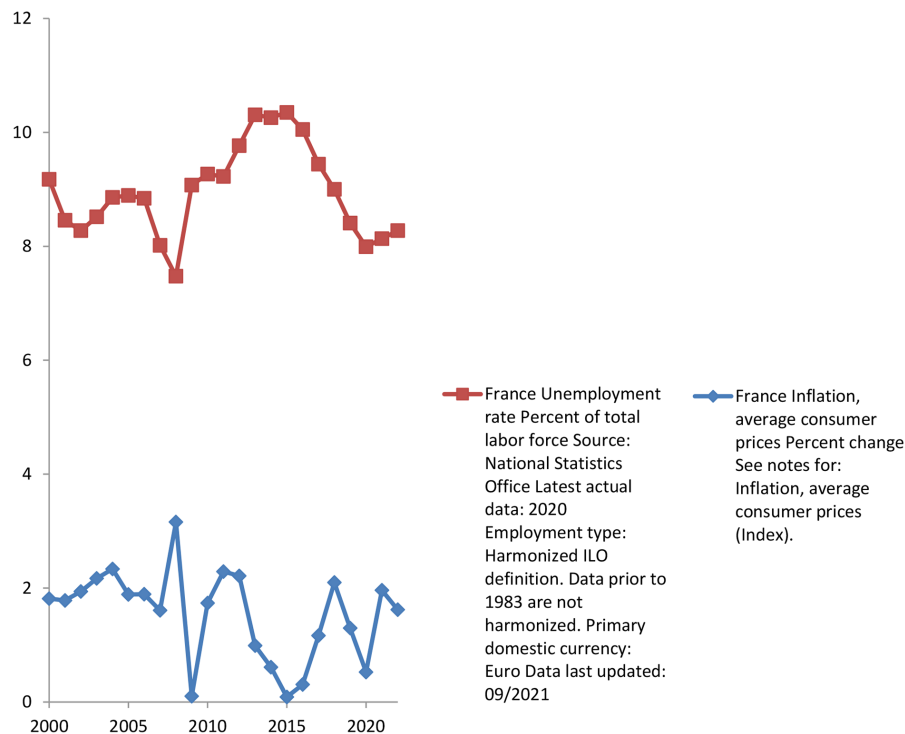
Figure 1. Inflation, average consumer prices, (% change) and unemployment rate (% of total labor force): France. 2000-2021

Source: www.imf.org

Now, we estimate the model (11). The results are presented in table 1.

Table 1. The estimated model (11): Inflation, average consumer prices, % change:
France, 2000-2021

R=0.45815		
N=22	**π**	ω
Estimate	**2.308603**	2.201169
Std.Err.	0.368858	0.531581
t(20)	6.258790	4.140795
p-level	0.00000	0.000506

Because μ= 2.308603, it can be concluded that convergent fluctuations of the inflation rate existed in France in the observed period.

5. CONCLUSION

This paper creates the chaotic inflation growth rate model (8). A key hypothesis of this paper is based on the idea that the coefficient μ = (1+δ) plays a crucial role in explaining local growth stability of the inflation rate, where, δ is a parameter that shows the responsiveness of the unemployment growth rate to the difference between 1 and the unemployment rate, u. The estimated value of the coefficient μ was 2.308603. In his case, the convergent fluctuations of the inflation rate existed in France in the period 2000-2021.

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The State and Development of Social Entrepreneurship in the Slovak Republic

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Abstract: *A social enterprise, which is part of the social economy, provides goods and services to the market in an entrepreneurial and innovative way and uses its profits primarily to achieve its social objectives. Social enterprises are also important for the national economy in terms of regional development. Through social enterprises and other social economy actors, the employment of disadvantaged and vulnerable people is promoted, thereby strengthening social, economic and territorial cohesion. The paper is devoted to a quantitative assessment of the state and development of social entrepreneurship in the Slovak Republic. It also focuses on the analysis of the development of a number of indicators in the field of unemployment, which reinforce the importance and need for social enterprises in the economy. Then, the paper deals with SWOT analysis, which allows for identifying the basic prerequisites for further development of social entrepreneurship in the Slovak Republic.*

1. INTRODUCTION

Social enterprises and social entrepreneurship have received increasing attention over the past two decades. The growing interest in social enterprises and social entrepreneurship is mainly due to the increasing attention to the problems of the contemporary world, both environmental and social (Nicholls, 2008). Social enterprises are becoming an attractive alternative for potential entrepreneurs seeking to respond to problems in their environment, but also for the public who are demanding business activities with environmental and social objectives and a responsible approach to the environment (Bosma et al., 2016). The primary idea of social entrepreneurship is to operate socially beneficial activities with the help of economic instruments. This means that it is still business first and foremost, but the elementary goal is to achieve positive social impacts, which makes the business activity meaningful not only for society, but often also for the workers of the enterprise and the entrepreneur himself. The creation of social value and change in society is seen as the primary goal of social enterprises, but the economic activity of the enterprise is also very much linked to the ability of the social enterprise to create social value and impact on society. It is through this creation of economic value (profit) that a social enterprise ensures its sustainability and independence. Thus, it is the generation of profit that is the key to growth, but also to the ability of the social enterprise to achieve its goals, vision and mission (Neck et al., 2009, Abu-Saifan, 2012). We can conclude that social entrepreneurship brings an ethical dimension and the principle of solidarity to entrepreneurship, i.e. social entrepreneurship has expanded its scope from the social sector to the market economy, and here it is making substantial transformational changes. Several economists refer to social entrepreneurship as 'business for the 21st century. Of course, there are also views such as Bieckman (2013) and Hudson (2009) who are less optimistic that social entrepreneurship has a chance to become a force for change. Social enterprises need to compete with mainstream for-profit businesses that are engaging in competitive struggles by way of wage cuts. Social enterprises that

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strive to pay fair wages to workers and fair prices to suppliers will not become viable and succeed in mainstreaming unless governments intervene with regulatory policies to level the playing field, changing the tax structure for conventional businesses and rewarding social enterprises. In contrast, Depedri (2010) argues that social enterprises have clear competitive advantages over commercial enterprises. Close relationships with clients and their search for locally specific solutions can help reduce wasted investment resources and enable more efficient operations. Social enterprises attract employees who are intrinsically motivated and who often accept lower wages. In addition, social enterprises very often have volunteers, which significantly reduces operating costs. Another competitive advantage is the non-distribution of profits, which leads to lower capital costs. Last but not least, social enterprises generally have a better alignment between individual and organizational goals, and this leads to lower motivation and management costs.

2. SOCIAL ENTREPRENEURSHIP IN THE SLOVAK REPUBLIC

In the Slovak Republic, social entrepreneurship is currently regulated by Act No. 112/2018 Coll. on Social Economy and Social Enterprises and on Amendments and Additions to Certain Acts, as amended in May 2018. This Act has changed the definition of entrepreneurship in the Commercial Code in the Slovak Republic. According to the newly expanded definition of entrepreneurship, this activity is not only a profit-making tool, but can also be a means to achieve a positive social impact, i.e. socially beneficial objectives. This has created a legislative space for the development of social entrepreneurship itself in the Slovak Republic, as this law regulates, among other things, the subjects of the social economy and the provision of support in the broader social economy space. It also regulates the instruments to prevent abuse of public support. A clear set of rules and tools to support social enterprises helps social enterprises to emerge and develop and stimulates opportunities in the field of social entrepreneurship. Prior to the adoption of this Act, there was in the Slovak Republic Act No 5/2004 on employment services, which, however, narrowed the meaning of the term 'social enterprise' to enterprises that focused on the work integration of the disabled or long-term unemployed ('WISE' - work integration social enterprises). At that time, social enterprises in the Slovak Republic included not only labor integration enterprises such as sheltered workshops, but also cooperative enterprises, municipal enterprises, agricultural social enterprises and some legal forms of non-governmental organizations, provided that they prepared disadvantaged citizens for the labor market. Continuously since the adoption of Act No. 112/2018 Coll. on Social Economy and Social Enterprises and on Amendments and Additions to Certain Acts, as amended, there has been a growing interest in the Slovak Republic in establishing a social enterprise or transforming an existing entity into a social enterprise, as evidenced by the number of registered social enterprises in Slovakia (as of May 2022, there are 516 registered entities in the Slovak Republic). Registration allows these enterprises to enjoy the full benefits of social entrepreneurship while helping to achieve financial sustainability. From a regional perspective, the number of registered social enterprises in the individual regions of the Slovak Republic reflects some extent the status and development of the number of registered disadvantaged jobseekers (UoS). The concept of disadvantaged jobseeker is defined in Section 8 of Act No 5/2004 on Employment Services. Disadvantaged jobseekers are mainly long-term unemployed citizens, citizens with disabilities, citizens over 50 years of age, citizens with less than secondary vocational education, citizens under 26 years of age, etc.

Table 1 shows the development of the number of disadvantaged jobseekers in the individual regions of the Slovak Republic in the period 2018 to May 2022, where we can clearly see that the largest share of disadvantaged jobseekers in the long term is shown by the regions of Prešov, Košice and Banská Bystrica. In these regions, more than 60% of disadvantaged jobseekers are registered in total. In terms of the type of disadvantage, the largest share was made up of those who had been unemployed for at least 12 calendar months, followed by the long-term unemployed and citizens who had attained less than secondary vocational education.

Table 1. Registered number of disadvantaged jobseekers by type of disadvantage in individual regions of the Slovak Republic

year	2018	2019	2020	2021	2022
total number of disadvantaged jobseekers* per region					
Region of Bratislava	7 025 (5%)	7 493 (5,58%)	12 051 (6,55%)	11 710 (6,9%)	9 666 (5,97%)
Region of Trnava	5 960 (4,25%)	6 312 (4,70%)	11 360 (6,17%)	10 075 (5,93%)	9 516 (5,87%)
Region of Trenčín	8 086 (5,75%)	8 288 (6,17%)	12 886 (7,00%)	10 938 (6,44%)	9 753 (6,02%)
Region of Žilina	12 805 (9,11%)	12 417 (9,24%)	18 841 (10,24%)	16 346 (9,63%)	15 372 (9,49%)
Region of Nitra	11 066 (7,87%)	10 118 (7,53%)	15 826 (8,60%)	14 762 (8,69%)	13 437 (8,29%)
Region of Banská Bystrica	25 752 (18,33%)	24 176 (18,0%)	31 069 (16,88%)	28 503 (16,78%)	27 863 (17,20%)
Region of Prešov	36 522 (25,99%)	34 992 (26,04%)	43 466 (23,62%)	40 940 (24,11%)	40 653 (25,09%)
Region of Košice	33 309 (23,70%)	30 546 (22,74%)	38 536 (20,94%)	36 541 (21,52%)	35 739 (22,06%)
Together in SR	**140 525 (100%)**	**134 342 (100%)**	**184 035 (100%)**	**169 819 (100%)**	**161 999 (100%)**

Source: Monthly statistics on the number and structure of jobseekers, *disadvantaged jobseekers = regulated by Act No. 5/2004 on employment services in section 8

As Table 2 documents, the Slovak Republic has been showing for several years a high share of disadvantaged jobseekers in the total number of jobseekers, which is over 80%. Social enterprises are one of the possible solutions to the problem of integration of these disadvantaged jobseekers. Therefore, if we compare the data in Table One with the data in Table 3, which maps the number of registered social enterprises in individual regions of the Slovak Republic, we find that interest in setting up a social enterprise is growing dynamically, especially in regions with a high concentration of disadvantaged jobseekers. This is because, despite legislative changes, the general public still perceives social enterprises exclusively in the context of employment. In a narrow sense, they are seen as work-integration initiatives aimed at integrating the most disadvantaged and vulnerable groups.

Table 2. Evolution of the number of disadvantaged jobseekers and their share in the total number of jobseekers in the Slovak Republic

year	2012	2013	2014	2015	2016	2017
jobseeker	425858	398876	373754	334379	276131	195583
chain index	1,065	0,936	0,937	0,894	0,825	0,708
disadvantaged jobseeker	295867	346371	336063	294120	239426	165869
share of disadvantaged jobseekers in the total number of jobseekers in %	*69,48%*	*86,84 %*	*89,92 %*	*87,96 %*	*86,71 %*	*84,81 %*
year	2018	2019	2020	2021	May 2022	
jobseeker	169802	165455	227341	200225	188886	
chain index	0,868	0,974	1,374	0,880		
disadvantaged jobseeker	140525	134342	184035	169819	161999	
share of disadvantaged jobseekers in the total number of jobseekers in %	**82,76 %**	**81,20 %**	**80,95**	**84,81 %**	**85,77 %**	

Source: Monthly statistics on the number and structure of jobseekers

As of 31 May 2022, we have a total of 516 registered social enterprises in the Slovak Republic. However, in terms of the date of establishment, of these 516 registered social enterprises, 154 were established before the legal regulation of the social economy and social enterprises (Act No. 112/2008 Coll.), which accounts for almost 30% of all registered social enterprises. The largest increase was recorded in 2020. During the Corona pandemic, there was a slight decline, but already in this year 2022, the number of registered enterprises has grown significantly (Figure 1).

Table 3. Number of registered social enterprises in the Slovak Republic by region

	before 2018	2018	2019	2020	2021	May 2022	% share in 2022
Region of Bratislava	-	1	2	10	21	28	5,42 %
Region of Trnava	-	1	4	17	27	45	8,72 %
Region of Trenčín	-	-	6	38	61	71	13,76 %
Region of Žilina	-	3	10	31	73	97	18,80 %
Region of Banská Bystrica	-	2	8	32	62	82	15,89 %
Region of Nitra	-	2	3	13	28	39	7,56%
Region of Prešov	-	3	8	22	53	68	13,18 %
Region of Košice	-	3	10	36	82	86	16,67 %
the number of social enterprises created in a given year	154 29,84 %	15 2,91 %	51 9,88 %	120 23,26 %	67 12,98 %	109 21,13 %	
together in SR	**154**	**169**	**220**	**340**	**407**	**516**	**100 %**
chain index	-	1,097	1,301	1,545	1,197	1,267	

Source: Processed on the basis of the Register of Social Enterprises and the Register of Organizations of the Slovak Statistical Office as of 31.5.2022
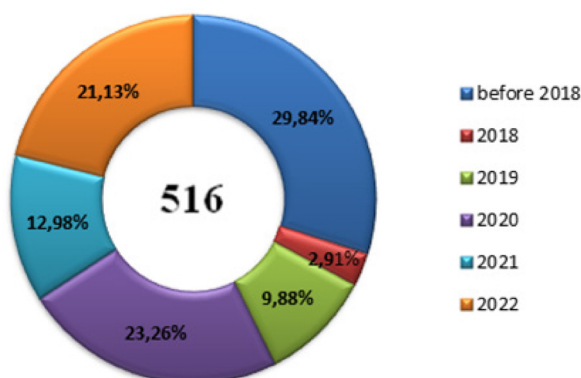
Figure 1. Structure of social enterprises by year of creation as of May 2022

Source: Processed on the basis of the Register of Social Enterprises and the Register of Organizations of the Slovak Statistical Office as of 31.5.2022

3. FUTURE RESEARCH DIRECTIONS

The social economy is one of the promising sectors of the national economy, which are also important for the economy of each country in terms of regional development and the blurring of regional disparities, not only in terms of solving employment problems, and this is also true for the Slovak Republic. This issue can be the subject of further analyses that will evaluate the impact of social enterprises on regional development in the conditions of the Slovak Republic. The areas of social entrepreneurship are not limited, but social entrepreneurship is also strongly influenced by the environment. Possible opportunities or threats to social entrepreneurship in the Slovak Republic are outlined in the table 4.

Table 4. SWOT analysis

internal factors	
strengths	*weaknesses*
• legislation, • growing local support for social enterprises, • creation of financial instruments for social enterprises, • the presence of regional social economy centers,	• the complexity of public procurement (administrative, time), • the still persistent narrow understanding of social enterprise as only a WISE, • poor awareness of social entrepreneurship, • insufficient knowledge of legislation, • high dependence of social enterprises on grant funding, • lack of investment aid for the development of social enterprises,
external factors	
opportunities	*threats*
• the ageing population in the Slovak Republic, the persistently high unemployment in many regions of the Slovak Republic, the problems of poverty, and the large Roma community living in the Slovak Republic will continue to create a high demand for social services, • support from the European Commission and the strengthening of the position of social entrepreneurship in national programmes, • multi-source financing of social enterprises (e.g. donations, subsidies, grants), • the increasing interest of regional and local authorities in social entrepreneurship.	• the high dependence of social enterprises on the external economic environment, • large regional disparities, • problems of stabilization of social enterprises (personnel and financial), • insufficient managerial and entrepreneurial skills, • political cycles - changing government attitudes towards social enterprise.

4. CONCLUSION

In conclusion, we can say that social enterprises today are gradually starting to respond to global challenges such as climate change, aging, cyber-security, extreme poverty and are trying to contribute to their solution through activities implemented at the local level. Through their activities, social enterprises often contribute to local development and improving the quality of life in both urban and rural areas. We see e.g. agriculture, support for local production, food self-sufficiency, environmental protection and innovation development as promising areas for social entrepreneurship in the future. In this respect, the establishment of social entrepreneurship appears to be a strategy that can bring positive effects to any economy in the areas of social and local development, employment development and social inclusion.

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Evaluation of Localization Factors for Allocation of Selected Slovak Enterprises

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Abstract: *Localization belongs to the important decision-making processes in the enterprise. The decision on the location of the accommodation facility depends on localization factors, i.e. site-specific characteristics. They represent the basis for the determination of the spatial location of the accommodation facility, especially in the long term. The location of the tourist accommodation facility specifies its economic structure and determines further development. The paper was directed on the recognition, description and evaluation of localization factors that were important in deciding on the location of selected accommodation facilities at the beginning of their activities. Localization factors are divided into these categories: labor, market, land and natural resources, environment, infrastructure, legal, social, and economic conditions. Research data were obtained by questionnaire method and combined interview method. The results of the survey in the final phase showed that entrepreneurs in the field of accommodation and tourist facilities were satisfied with the location of their facility and evaluated their decision as the most correct.*

1. INTRODUCTION

Tourism brings various benefits to the country's economy, however, each country has different conditions and opportunities for attracting domestic and foreign visitors for accommodation-related stays. Entrepreneurship in tourism is associated with the analysis of many factors, whether in terms of overall or terms of regional conditions. Based on geographical and localization assumptions, Slovak regions have different potentials for tourism. Some tourists/visitors can combine stay and travel with the countryside and nature, another part of visitors prefer stays with attractions in Slovak cities or combine travel with a tour of historical monuments.

The Government of the Slovak Republic perceives domestic tourism as "an important generator of sustainable growth of Slovakia's regions and an important factor for improving the life quality of the population". Due to the Covid-19 pandemic and the current situation of rising prices in the energy and food market, the Slovak Hotel and Restaurant Association estimates "the loss of tourism revenues 500 million euros, while about 60 thousand jobs are at risk" (*Tourism in Slovakia; Act No. 91/2010 Coll. on the Promotion of Tourism*). The Government of the Slovak Republic has defined "as the main goal of reducing seasonal disparities in the supply of tourism by sustainable use of the country's potential and improving the recognizability of Slovakia as an attractive and authentic holiday destination" (*Sustainable Tourism Development Strategy until 2030*). "The competitiveness and sustainability of tourism depends on the ability of tourism operators to take advantage of the existing innovation environment; innovations, together with other factors, are considered to be the driving force for the restart of tourism in Slovakia after

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COVID-19" (Kollár & Matúšová, 2021). Analysis of the determinants of tourism performance has shown that increasing the level of efficiency is possible by combining with at least two or more tourist attractions (Corne & Peypoch, 2020). Modified marketing mix models include new tools that affect the target customer. According to Vrábliková (2019), for tourism, these are "travel agencies, catering, accommodation, transport and additional services".

The public sector often faces a lack of financial resources needed to fund tourism projects. The private sector is more efficient than the public one in the implementation of large infrastructure projects in tourism, therefore various models of public-private partnerships prove to be a suitable solution (Beresecká & Papcunová, 2020). Particular country addresses specific tourism issues, e. g. data on the seasonal demand of tourists in Norway were the basis for research into selected economic factors about their impact on the seasonality of tourism (Xie, 2020). Tourism in Italy is an important source of income throughout the year, mainly due to very good natural conditions. Authors (Alfano et al., 2022) declare that the accommodation tax is one of the most common forms of tourism taxation to address the negative externalities associated with tourism. As reported by Mihăilă et al. (2019), balneo-climate tourism and outdoor activities in the north-east region of Romania can generate important revenue for the region, provided that investments are made in accordance with an appropriate management strategy and effective promotion. Research on the sources and components of social anchorage (trust, close personal relationships, emotional attachment, willingness to help, local patriotism) has made it possible to better understand business cooperation decisions that are important for the competitiveness of tourist destinations (Czernek-Marszałek, 2021). The research results on the visitors' attitude and connection to the natural environment provide "the division of tourists into three ecotypes: eco-destructive, eco-impartial and eco-involved" (Ștefănică & Sandu, 2021).

Doing business in the area of tourism requires the availability of accommodation facilities. For the success of the accommodation facility, it is necessary to know and correctly evaluate the localization factors determining the interest of visitors in the location and accommodation during their stay. Gubáňová and Hanáčková (2014) state these "main categories of localization factors: labor, market, land and natural resources, environment, infrastructure, legal, social and economic conditions". The combination of localization factors makes it possible to find the optimal place for the enterprise's location. According to Gregorová et al. (2015), localization and selective assumptions alone are not enough for the emergence and development of tourism, as they have only a potential character. Implementation preconditions are also necessary for tourism, i.e. the given area must have transport preconditions, suitable tourism infrastructure and facilities with supplementary services. The destination of tourism is not only the geographical area but also a set of opportunities for the production of goods and services in the private and public sectors (Gúčik et al., 2012). Location is often a determining factor in planning a tourism workforce. Solnet et al. (2014) provide a new perspective on the dilemma in the development of tourism when the growth of the attractiveness of the destination is not in line with the accompanying growth of the attractiveness of the locality for the necessary workforce.

2. RESEARCH DATA AND METHODS

The research objects were selected tourist accommodation facilities in Slovakia, which were classified in the category of small enterprises: boarding house HRON in the village Pohorelá, boarding house KOLIBA u KUBA in the village Hruštín, boarding house SALAŠ CABAJ in the village Cabaj, boarding house LIMBA in the village Liptovský Ján, and mountain hotel

AKADEMIK in the village Pribylina (situated in the Račkova Valley in the West Tatras). Data on accommodation facilities from well-developed websites have also been used. The next step was to obtain materials on the issue of localization factors via the questionnaire survey and their processing. The basic idea in designing the items of the questionnaire was to evaluate the selected localization factors when deciding on the location of these accommodation facilities in Slovakia at the beginning of their business activities. The set of localization factors was divided into three categories: land and natural resources, infrastructure and equipment, and environment.

The survey was conducted in January 2022. The questionnaire contained 20 questions, which were answered by entrepreneurs in mentioned accommodation facilities. In addition, it was used the combined interview method. To determine the significance of the evaluated localization factors, there was used the Likert scale expressed by numerical values. The importance of localization factors for the allocation of the accommodation facility was measured on a scale from 0 to 4 (0 - no significance, 4 - decisive significance). The method of analysis and comparison consisted of the evaluation of a questionnaire survey, and evaluation of localization factors in particular categories based on the assigned degree of significance (numerical data) from entrepreneurs in accommodation facilities, from which the arithmetic average was calculated. In individual categories, it was determined the order of localization factors according to the degree of significance and its arithmetic mean.

3. RESULTS

Localization factors are the specific characteristics of a given site that affect the location of the accommodation. Localization is considered as the essential step for the successful start of tourist business. Deciding where to locate a business is very difficult because the location is a set of characteristics that significantly affect the operation of the tourism facility. These include factors: the size of the land, the position of the location, access to the location, its visibility, the relationship to demand generators, other facilities and the relationship to competition.

3.1. Significance of Localization Factors in the Category of Land and Natural Resources

It follows that localization is not affected by a single factor, but the decision to allocate a business depends on a number of factors. The extent of the territory for the construction of tourism facility depends on the type of accommodation facility, territorial requirements according to performed activities, while it is necessary to take into account land ownership, land prices and the development of the real estate market in the region. The land is a component of the environment that is crucial and irreplaceable for the country, whether in terms of economic and productive, locational, historical, recreational, etc. However, the land also acts as a basic localization factor in space, because it is the land, its quality and quantity that determine the future localization of human activities in the region. Common localization factors in the category of land and natural resources (Fig. 1), which were of great importance for most accommodation facilities, include property rights (average 3.0). Enterprises considered the price of land (average 2.0) and the price of the land lease (average 2.2) to be factors of average importance. Buildings must respect the boundaries of land, ownership relations as well as the location and configuration of the terrain in which the building must be incorporated in terms of material and shape.
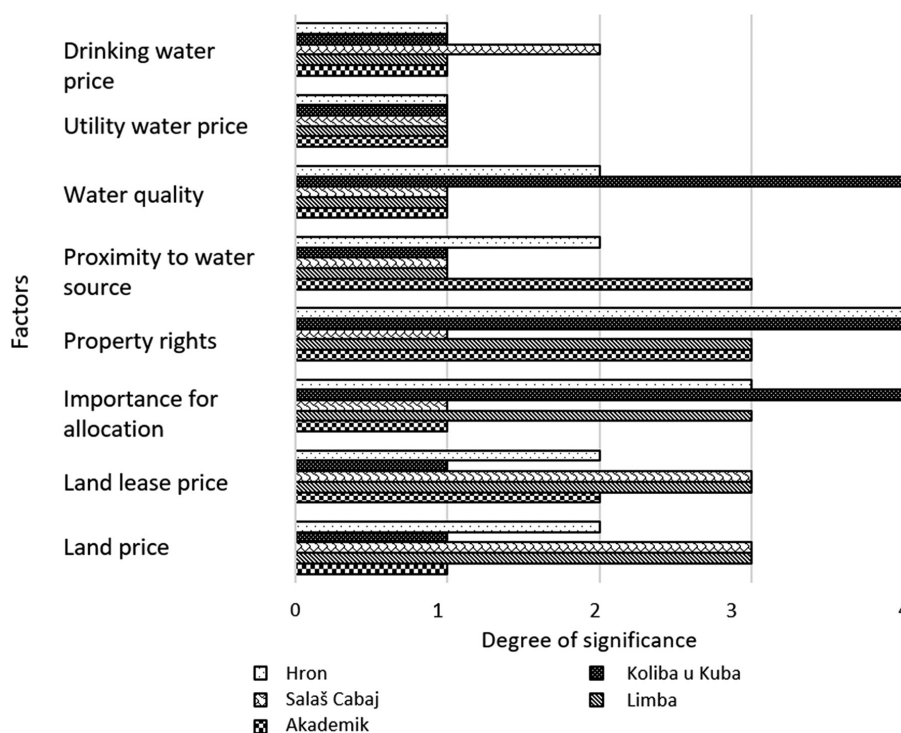
Figure 1. Significance scale of localization factors
in the category of land and natural resources
Source: Own processing

Water resources are used to supply drinking water for accommodation facilities, sports and relaxation complexes and other additional services for tourist visitors. On the other hand, these tourist complexes pollute watercourses by producing wastewater. The factors of proximity to the water source (average 1.6) and water quality (average 1.6) were of little importance in the establishment of the accommodation facility.

3.2. Significance of Localization Factors in the Category of Infrastructure and Equipment

Another factor in deciding on the location of the accommodation facility is the level of infrastructure and equipment. Existing transport and communication networks will save entrepreneurs the costs of building them. In the category of infrastructure and equipment (Fig. 2), the factors of development and cost of road transport were of average importance (average 1.8). But, the existing road network near some accommodation facilities is in poor condition. The branching of information channels (average 1.6) is of little importance when deciding on the location of the accommodation facility. The factor of advertising and promotion (average 2.6) played an average role in deciding on the allocation of accommodation facilities because it is not enough just to offer an excellent location or accommodation at an interesting price if they are not promoted.

Accommodation facilities try to support sales through promotion and advertising. While advertising offers us a reason to buy, sales promotion offers us an incentive to buy. Facilities use their well-designed website to promote sales. Common localization factors that were of average importance for most accommodation facilities include the possibility of using their own business premises (average 2.2).
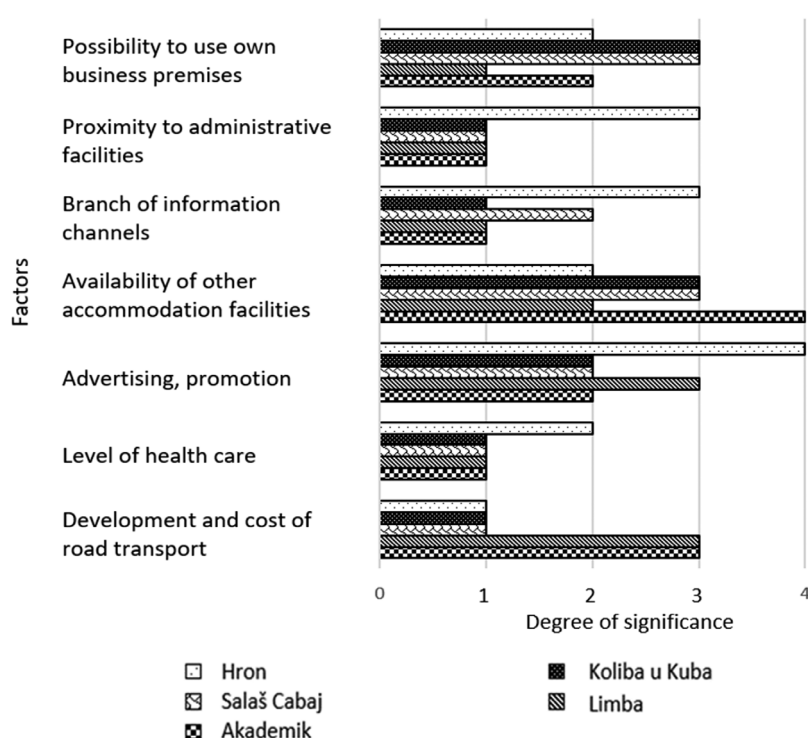
Figure 2. Significance scale of localization factors
in the category of infrastructure and equipment
Source: Own processing

3.3. Significance of Localization Factors in the Category of Environment

In addition to the appropriate architectural design and location of tourism facilities, it is important to take measures to eliminate their negative impact on the environment. Above all, it is a matter of ensuring a system of waste collection and disposal, wastewater treatment, solutions for access to tourism facilities, parking, noise reduction, emissions from heating systems, etc. Accommodation facilities currently need to replace their heating sources with renewable ones, which will help reduce greenhouse gas emissions. It is necessary to implement buildings so that the original landscape structure is preserved. In the category of the environment (Fig. 3), the factor of the possibility of storage, waste disposal, recycling (average 2.0) gained average importance when deciding on the location of the accommodation facility.

Natural resources enter the business in a differentiated way, while in the field of tourism part of the business depends on the natural environment. The most important phenomenon in the relationship between business and the natural environment is the trend of sustainable development. The aim is to avoid a permanent threat to the environment and to maintain the continued use of natural resources. The natural environment (average 3.6) belongs to the important localization factors for the allocation of accommodation facilities.

The surrounding nature, monuments, or other attractions in the given locality are important for the tourist participant, while the visitor sensitively perceives the incorporation of the tourist facility into the surrounding landscape and development. Climatic conditions are one of the main factors in the implementation and distribution of tourism. The climatic conditions factor (average 3) was of great importance in the establishment of accommodation facilities. The climate works through its elements such as temperature, the amount of precipitation and its distribution,

the length of sunshine and humidity. Attendance depends on accommodation options, the level of services provided and the attractiveness of individual regions. In addition to the offer of accommodation capacities, it can be a stay at the farm, with typical rural architecture, recreational activities, harvesting crops or forest crops, studying folklore and local customs, and much more.
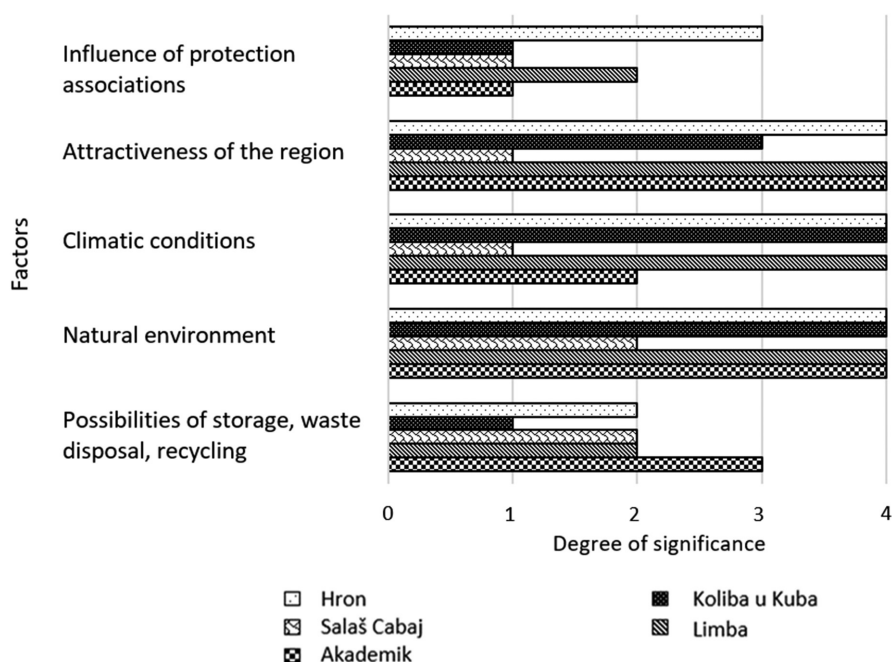
Figure 3. Significance scale of localization factors in the category of environment

Source: Own processing

4. FUTURE RESEARCH DIRECTIONS

Tourism in the region offers many positive aspects, but there are also many of its adverse effects. These are the rising price level of goods and services, the increasing price of land, the growth of investment costs for the development of equipment, the security situation, the cleanliness of the environment, and the growth of energy and water consumption. A significant negative impact is a threat to the environment, excessive urbanization, social tension between the local population and tourism participants, pathological social phenomena (crime, alcoholism, etc.), as well as the disappearance of traditional production in individual regions of Slovakia. For the young generation, it is necessary to show the importance and value of the country's cultural heritage through tourism.

5. CONCLUSION

The paper evaluates selected localization factors that were important in deciding on the location of selected accommodation facilities at the beginning of their activities. The questionnaire survey and the method of the combined interview showed that entrepreneurs in individual accommodation facilities were satisfied with the chosen location of their facility and evaluated their decision as the most correct.

In assessing the significance of localization factors that affect the location of the accommodation facility, in the category of land and natural resources, the ownership relationship factor played a major role; this factor is particularly important in land use planning and subsequent land development, which in the case of accommodation facility affects the region. In the

category of infrastructure and equipment, the factors of advertising and promotion, and the possibility of using their business premises, were of average importance for most accommodation facilities. Entrepreneurs in the sector of tourist accommodation facilities offer their services through advertising to attract other participants in tourism. In selected accommodation facilities, they promote services that they guarantee and provide at a high level.

In the environment category, the factor of the natural environment, which currently attracts tourism participants and gives them priority over the choice of the facility, has become crucial in deciding on the facility location. Another important factor in the decision-making process was the climatic conditions, which have a significant impact on tourism. At present, it is possible to observe the increase and intensity of the convective phenomenon of weather, storms, torrential rain and storms. Furthermore, the incidence of dry seasons during the year is expected to increase. The duration of the snow blanket is decreasing, which threatens the existence of ski resorts. In order to remain competitive, this means taking into account the increased costs of technology and the operation of artificial, environmentally demanding snowmaking. The length and quality of the tourist season change in these volatile conditions.

Slovakia disposes outstanding natural conditions for the tourism industry, tourist activity as well as tours of historical monuments. Favorable climatic conditions, the beautiful nature of mountains and coniferous forests create ideal conditions for tourism and sports activities. However, there is a need to improve the quality of service in existing facilities. It will be important to focus on guests from abroad, who need to prepare a comprehensive range of capacities, services and attractiveness to support permanent and repeat visitors.

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Status and Trends in the Development of Small and Medium-Sized Enterprises in the Service and Tourism Sector in the Slovak Republic

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Abstract: *Small and medium-sized enterprises are typical of the tourism sector, they are adaptable and able to meet individual as well as specific consumer demands. This paper analyses the sectoral and regional structure of tourism SMEs (exactly how many of them are in the sector, where they are located and what economic activity they carry out within the tourism sector). The analysis of the structure will provide a sufficient picture of which sectors most SMEs operate in and in which region these SMEs are located. A subsequent comparison of the pre-pandemic and post-pandemic periods will reveal changes in the status and development of SMEs in the service and tourism sectors in Slovakia. And then statistical methods of forecasting development trends will make it possible to outline the possible future direction of the development of SMEs in Slovakia after the end of the pandemic.*

1. INTRODUCTION

Tourism is an important sector that has an impact on the development of the economy of every country, it is an important component of every national economy. It plays an important role especially from the point of view of economic and social indicators of the economy. It is the most important source of well-being for many regions and countries. The ability of the national economy to benefit from tourism depends on the availability of investments for the development of the necessary infrastructure and its ability to meet the needs of tourists. Tourism represents a huge potential for the economic growth of any country. It represents a key sector at the macroeconomic level. This means that this type of industry and its development is a stimulating and positive contribution to the state's balance of payments and also helps to eliminate regional disparities. (Wall, G., Mathieson, A., 2006, p.70). And last but not least, it is also important for the labor market. Tourism represents the largest and most dynamically developing service industry today. It is constantly enriched with new activities, markets, destinations and is influenced by various globalization trends. It is considered an important tool for regional development, preserving the quality of the environment and protecting native cultures. (Gregorová, B. et al., 2015, p.7) As such, the Slovak Republic has a very good potential for the development of many forms of active tourism (urban and cultural tourism, spa and health tourism, winter tourism, summer mountain and water tourism, rural tourism and agrotourism) (Gregorová, B. et al., 2015, p.36).

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2. TOURISM IN THE SR AND SMALL AND MEDIUM-SIZED ENTERPRISES

Under the conditions of the Slovak Republic, small and medium-sized enterprises provide the decisive offer of services in the tourism industry. In the target destinations, they create an offer of services (e.g. accommodation and catering services, axle transport, rental of equipment, etc.) and thereby significantly determine the degree of competitiveness, or they contribute to its further development. Why is tourism typical for small and medium-sized businesses? This is due to their characteristic features, especially their ability to adapt and respond flexibly to various specific and individual demands from the demand side. Exactly as stated by Gučík (2010), the size of enterprises has an impact on the efficiency of business activities, the efficiency of the use of technology, the introduction of modern technologies, etc. Small and medium-sized enterprises represent the driving force of tourism, its growth and development, they are a source of innovation and competitiveness in the tourism industry. The development of the number of small and medium-sized enterprises operating in the tourism industry in Slovakia is shown in Table 1. The table also shows the share of tourism SMEs in the total number of SMEs in the economy. This share ranges from 4 to 5%. But despite such a small share, the economic contribution of tourism businesses is high for the economy. In the period before the outbreak of the COVID-19 pandemic in 2019, the share of tourism in the creation of GDP was 6.2 billion EUR (6.4% of GDP), which is a really interesting value. In 2020, however, we have already recorded a 49.6% drop to the level of 3.1 billion EUR (3.4% of GDP).

Table 1. Development of the number of SMEs in tourism in the Slovak Republic

year	2016	2017	2018	2019	2020	2021
number of SMEs	25346	25302	23881	25360	25129	25499
chain index		0,998	0,943	1,061	0,990	1,014
share of tourism SMEs in the total number of SMEs in the Slovak Republic (in %)	4,55%	4,71%	4,27%	4,26%	4,21%	4,02%

Source: Based on data from the Statistical Office of the Slovak Republic

Table 2. Number of SMEs operating in tourism by region, in 2020 and 2021.

	2020		2021		change of share
	number	share in %	number	share in %	(in %)
Region of Bratislava	6054	24,09	6000	23,53	-0,56
Region of Banská Bystrica	2640	10,51	2623	10,29	-0,22
Region of Košice	2542	10,12	2642	10,36	0,25
Region of Nitra	2890	11,50	2968	11,64	0,14
Region of Prešov	3115	12,40	3192	12,52	0,12
Region of Trenčín	2270	9,03	2335	9,16	0,12
Region of Trnava	2686	10,69	2743	10,76	0,07
Region of Žilina	2932	11,67	2996	11,75	0,08
together in SR	**25129**	100,00	**25499**	100,00	0,00

Source: Based on data from the Statistical Office of the Slovak Republic

From a regional point of view, the Bratislava region has the smallest and medium-sized tourism enterprises at 23.5%. The Bratislava region is followed by the Prešov region, whose enterprises make up 12.52% of all enterprises operating in the tourism industry. The number of enterprises in the Žilina and Nitra regions ranges from 11.5 to 11.75%. The least active tourism SMEs can be found in the Trenčín Region (9.16% in 2021). Table 2 shows the development of the number

of small and medium-sized enterprises in the tourism industry in individual regions of the Slovak Republic over the last two years. One of the priority goals of the state's economic policy is the reduction of regional disparities, and tourism as such can be very helpful in this regard. It should be emphasized here that tourism is strongly dependent on local infrastructure. And, therefore, the quality of the infrastructure is an important determinant of the flow of visitors to the region, thereby contributing to the overall development of this region. With the construction and improvement of the infrastructure, the region becomes more attractive for tourists and they begin to come to the destination, which will create the need for the creation of business entities that will satisfy the needs of tourists.

Figure 1 documents the development of sales in small and medium-sized tourism enterprises in Slovakia in the period before and after the outbreak of the COVID-19 pandemic. Here we can clearly observe a drop in sales to the level of EUR 95,658.97 (a drop of 87.23% compared to 2019) in 2020, which represents the lowest sales not only for the monitored period but for several decades in Slovakia. Slovak tourism suffered losses in the amount of approximately EUR 653 thousand compared to the previous monitored year. Because as a result of the dangerous spread of the disease COVID-19, not only in Slovakia, but also worldwide, there was a restriction on travel, a restriction on the operation of accommodation facilities, restaurant facilities and cultural institutions.
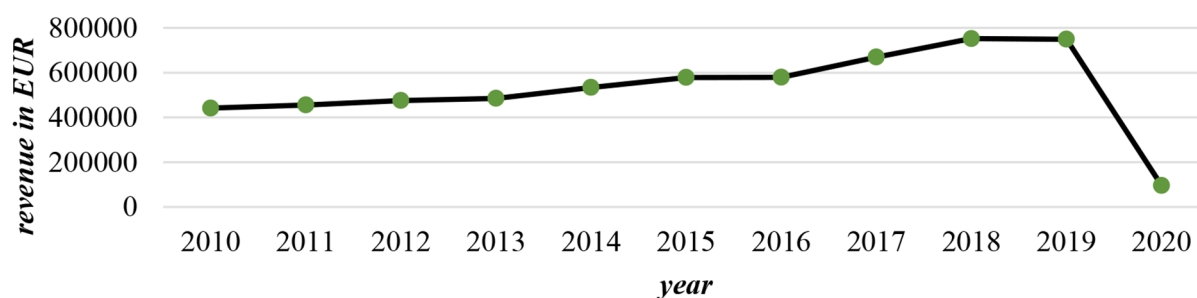
Figure 1. Development of tourism revenues in Slovakia in 2010 – 2020 in EUR
Source: Based on DATAcube data

Of course, small and medium-sized tourism enterprises have their irreplaceable place in the creation of jobs in the economy. Their share of total employment in the economy was 6.2% before the pandemic. In 2019, small and medium-sized enterprises operating in the tourism industry employed 184,891 employees. In the following year, there were only 148,900 employees (a decrease of 19.47%). Despite financial aid from the state, small and medium-sized enterprises were unable to maintain jobs during the pandemic and were forced to lay off workers. Many small and medium-sized enterprises in the tourism industry suffered significant financial losses and, because they could no longer withstand the ongoing and worsening pandemic situation, were forced to close their business activities. Even in 2021, it was not possible to increase the number of employees in small and medium-sized tourism enterprises, and this year too we recorded a year-on-year decrease in jobs by 0.2%.

From a regional point of view, the highest increase in the number of unemployed in the tourism industry (the so-called Covid period) is recorded in the Žilina region at 25.6%, followed by the Prešov region at 17.4%, the Banskobystrický region (14.2%) and the Košice region (12.2%). These regions had an increase of more than 10%. Trnava and Nitra region had 9.3% and the lowest increase was in Bratislava (7.1%) and Trenčín region (5.9%).

Table 3. Number of SMEs operating in tourism by SK NACE, 2016-2021.

		2016	2017	2018	2019	2020	2021
Passenger transport (rail, road, water, air)	Taxi	1537	1571	1351	2193	2370	2242
	Other passenger land transport	3969	4003	3803	3485	2940	2892
	Maritime and coastal passenger water transport	4	4	5	4	3	3
	Inland passenger water transport	22	30	30	40	42	40
	Passenger air transport	38	39	34	33	37	51
Accommodation services	Hotel and similar accommodation	7000	673	639	643	648	665
	Tourist and other short-term accommodation	1200	1305	1360	1580	1785	1899
	Motorhomes, campsites and places for caravans	25	25	23	21	20	16
Catering services	Restaurant activities and mobile sales	11891	11647	10891	11338	11299	11557
	Hospitality services	3729	3750	3698	3885	3690	3814
Rental of equipment for personal transport	Rental and leasing of cars and light motor vehicles	659	608	535	536	514	500
	Rental and leasing of trucks and other heavy vehicles	26	31	35	37	74	67
	Rental and leasing of recreational and sports equipment	79	97	113	146	332	341
Activities of travel agencies, reservation services of travel agencies and related activities	Activities of travel agencies	676	689	606	643	652	652
	Activities of travel offices	571	587	531	507	494	507
	Other reservation services and related activities	219	242	226	269	229	253
Together		**25346**	**25302**	**23881**	**25360**	**25129**	**25499**

Source: Based on data from the Statistical Office of the Slovak Republic
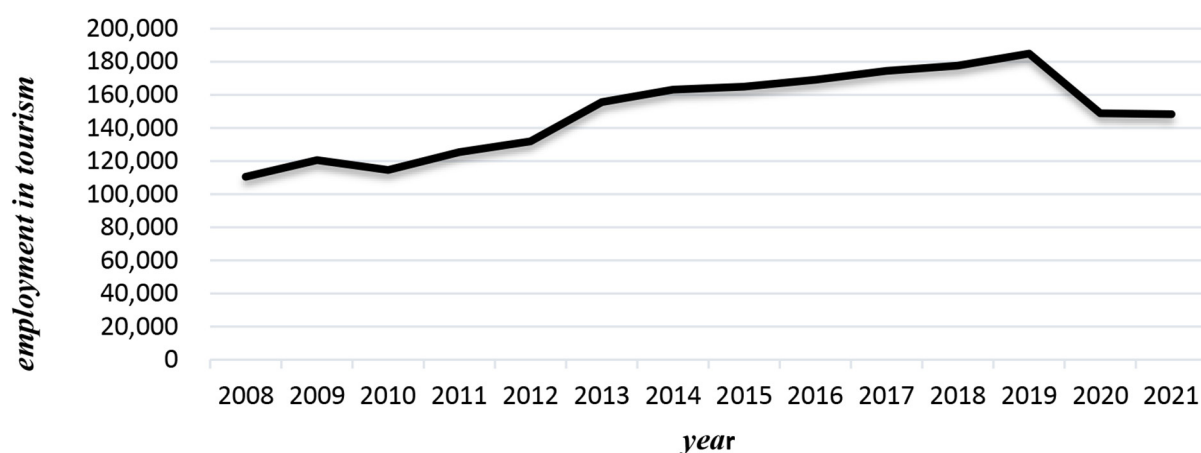
Figure 2. Development of the number of employees in tourism in the Slovak Republic
Source: Based on DATAcube and data extracted from OECD.Stat

3. FUTURE RESEARCH DIRECTIONS

From other businesses that operate in other sectors of the national economy, businesses operating in the tourism industry are distinguished mainly by frequent seasonality, changes in demand, and demands on human resources (not only in terms of numbers but also in terms of qualifications and performance). Through their activity, small and medium-sized tourism businesses influence the tourism destination positively (e.g. growth in attractiveness and awareness of the destination, a wider range of services, higher employment in the destination and its surroundings, higher income for the destination and its surroundings), but also negatively (for example there is increased movement of tourists, increased noise, number of cars, growth of ecological loads). Although SMEs have an irreplaceable place in the industry, in the field of tourism they encounter many limitations (limited amount of financial resources, high level of administrative burden, lack of qualified people, increasing cost of labor, which constitutes a significant part of costs in services, strong mutual competition, and by large companies, low level of joint management, etc.). The tourism industry is significantly affected by new trends and challenges, which entail the need for the industry to react and adapt to new conditions:

- digitization, virtual reality,
- development of shared economics,
- robotics and artificial intelligence - use of chat-bots, robots,
- use of biometrics at airports/train stations, voice commands at hotels, fingerprints,
- intelligent tourism,
- ecological travel – reducing the carbon footprint, electric cars, eco-friendly hotels, restaurants and other ecologically oriented businesses,
- healthy foods and organic foods.

4. CONCLUSION

In conclusion, we must state that as a result of the dangerous spread of the disease COVID-19, there has been a worldwide restriction on travel, a restriction on the operation of accommodation facilities, restaurant facilities and cultural institutions. The adopted anti-pandemic measures of the governments in most cases did not allow residents to travel. The outbreak of the COVID-19 pandemic was an immediate shock to the tourism industry and has caused this area of the economy to be loss-making. On the one hand, this situation in the tourism industry is perceived as an excellent opportunity for the modernization of tourism, the development of tourism in new dimensions in accordance with ecological and social responsibility. On the other hand, of course, this situation is perceived negatively, from the point of view of a significant drop in sales in the tourism industry, the disappearance of promising business entities in the regions, the dismissal of employees who have taken jobs in other areas in the meantime and are no longer interested in returning, etc.

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Travel Trends: *12 Opportunities for the Travel Industry.* Online. Available at: https://www.revfine.com/travel-trends/

Financial Contagion in Central and Eastern European Capital Markets: The Case of Russia's Invasion of Ukraine

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Abstract: *Russia invaded Ukraine on February 24th, 2022, marking a steep escalation of the Russo-Ukrainian War, which began in 2014 after the Ukrainian Dignity Revolution. The invasion caused Europe's largest refugee crisis since World War II, with more than 5.5 million Ukrainians leaving the country and a quarter of the population displaced. At the outbreak of war in 2014, Russia annexed Crimea and Russian-backed separatists who participated in the south-eastern Donbas region of Ukraine, starting a regional war there. Considering these events, it is relevant for policymakers and regulators to understand how contagious crises are to take appropriate measures to prevent or contain the side effects. To verify the levels of contagion or interdependencies we use Pindyck and Rotemberg's t-statistic, as well as Forbes and Rigobon's t-test, which suggests that we are facing extreme volatility in the capital markets analysed, and financial contagion is very significant. In conclusion, the capital markets analysed mostly show that correlations have increased in this period of uncertainty in the global economy (Russian invasion in Ukraine), evidencing that investors will find it difficult to diversify risk in these markets. The authors believe that the results achieved represent interest for investors seeking opportunities in these stock markets, and for policymakers to undertake institutional reforms to increase stock market efficiency and promote sustainable growth in financial markets. These findings also open room for market regulators to take steps to ensure better information in these regional markets.*

1. INTRODUCTION

In recent years, globalization has shown that the correlation between international financial markets has increased. The linkages between international stock markets can be strong during quiet periods as well as in times of crisis, which may make it difficult to implement portfolio diversification efficiently. The integration of capital markets globally has been a hot topic in recent decades, especially after the stock market crash during the 2008 global financial crisis. Investors who buy stocks in domestic and foreign markets seek to reduce risk through international diversification. Risk reduction occurs if the various markets are not perfectly correlated. The increasing correlation between markets during and after crises has restricted the possibilities for international diversification. From the investor's point of view, knowledge of the form and intensity of interdependence between different financial markets is vital for making efficient hedging decisions to minimize the adverse effect of uncertainty on expected investment returns.

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Similarly, understanding the interdependent relationships between international stock markets facilitates the identification of diversification opportunities. The demise of barriers to investment in recent years has meant that many countries have undergone the process of integration on both a financial and economic level. This leads to the benefits of international diversification being called into question mainly due to the various financial crises that have plagued financial markets around the world (Dias et al., 2020; Dias et al., 2021; Dias and Carvalho, 2021; Dias et al., 2022; Dias, Alexandre, et al., 2021; Dias, Heliodoro, and Alexandre, 2020; Dias, Heliodoro, Alexandre, et al., 2020; Dias, Heliodoro, Alexandre, Santos, and Farinha, 2021; Dias, Heliodoro, Alexandre, Santos, and Vasco, 2021; Dias, Pardal, et al., 2020; Dias, Santos, et al., 2021; Dias et al., 2019; Dias and Carvalho, 2020; Dias and Pereira, 2021; Dias and Santos, 2020; Heliodoro et al., 2020; Pardal, P., Dias, R., Šuleř, P., Teixeira, N., and Krulický, 2020; Pardal et al., 2021; Silva et al., 2020; Vasco et al., 2021; Zebende et al., 2022).

This paper aims to analyse the financial contagion in the stock market indices of Austria (Austrian Traded), Budapest (BUX), Bulgaria (SE SOFIX), Croatia (CROBEX), Russia (MOEX), Czech Republic (PragueSE PX), Romania (BET), Slovakia (SAX 16) and Slovenia (SBI TOP) in the period from January 2nd, 2017, to May 6th, 2022. The results of Pindyck and Rotemberg's t-statistic as well as Forbes and Rigobon's t-test show that the analysed capital markets exhibit extreme volatility and contagion is very significant. These findings show that the hypothesis of implementing risk diversification strategies could be called into question.

This research adds relevant contributions to the literature, namely in what concerns understanding whether the uncertainty experienced in the global economy arising from the global pandemic of 2020 and the Russian invasion of Ukraine in 2022 cause contagion between the capital markets of Austria (ATX), Slovenia (SBITOP), Hungary (BUDAPEST), Croatia (CROBEX), Bulgaria (SOFIX), Poland (WIG), Czech Republic (PX PRAGUE), Russia (IMOEX), Romania (BET); to the best of our knowledge, this is the first study that examines these markets in a period that contemplates the War of 2022.

In terms of structure, this paper is organized into 5 sections. In addition to the current introduction, section 2 presents a state-of-the-art analysis of articles on financial contagion in international financial markets, section 3 describes the methodology and section 4 contains the data and results. Section 5 presents the general conclusions of the paper.

2. LITERATURE REVIEW

Since the mid-2000s, international financial markets have been subject to a significant number of financial crises, namely the subprime crisis in the US in 2008, and the sovereign debt crisis in Europe in 2010, which originated in developed economies. These events significantly infected developed economies, however, this significance was not dense in emerging economies (Wong and Li, 2010).

Assessing the current state of financial integration and shocks between markets is also relevant from the standpoint of cost versus benefit analysis. The literature commonly agrees that financial integration brings benefits, in good times. However, in times of crisis, high financial integration increases the probability of contagion, due to the close interrelationship between financial markets through the proximity of markets. Overall, in the long run, the benefits of financial integration are expected to outweigh the costs (Babecký, Komarek, and Komárková, 2017)

Jin and Na (2016) studied the contagion effects between the BRIC capital markets and the U.S. market; the authors show that during the 2008 financial crisis there was contagion between the stock markets analysed. Tsai (2017) analysed the financial markets of China, Japan, Europe and the United States and evidence partial contagion between markets. Alexakis and Pappas (2018) analysed the existence of financial contagion in the European Union during the 2008 and 2010 financial crises, showing significant contagion in all sectors of activity.

De Morais et al. (2019) investigated the existence of contagion in 11 emerging country stock markets, namely from Latin America and Central Europe. For this purpose, they used deterministic GARCH and stochastic volatility models, both univariate and multivariate. The authors show the presence of financial integration among the countries and further suggest that the crisis has intensified these relationships. In addition, several characteristics common to the financial series were identified, such as leverage effect, grouping volatility, and persistence.

Meanwhile, the authors Heliodoro et al. (2020) analysed financial contagion in the six major markets in Latin America (Argentina, Brazil, Chile, Colombia, Mexico, and Peru) and the U.S. over the period 2015-2020. The results of the autocorrelation tests are fully coincident with those obtained by the BDS test. The rejection of the null hypothesis, i.i.d., can be explained, among other factors, by the existence of autocorrelation or by the existence of heteroscedasticity in the stock market indices series, in which case the rejection of the null hypothesis is explained by the non-linear dependence of the data, except for the Argentinean market. However, significant levels of contagion between these regional markets and the U.S. were expected to occur as a result of the global pandemic (COVID-19), which did not happen. Gunay (2020) examined the influence of the 2020 global pandemic on six stock markets, evidencing contagion and structure breakdowns between February 19th and 21st, 2020, in most markets, while in the Chinese market the breakdown is on January 30th, 2020. Fang et al. (2021) analysed contagion in developed and emerging markets over the period 2000-2016; for this purpose, they used the impulse response function method and the dynamic conditional correlation model (MGARCH). The authors show that the level of volatility in emerging equity markets was higher than in developed markets, namely the European Union and US markets. Additionally, they suggest that emerging equity markets are significantly subject to residual contagion during the subprime mortgage crisis in the US and the prolonged debt crisis in Europe. Moreover, the residual contagion effects of these two crises are noticeably heterogeneous across emerging markets. Malik et al. (2021) investigated the presence of pairwise contagion or volatility transmissions in the stock market returns of India, Brazil, Russia, China, and the US before and during the COVID-19 pandemic period; for the purpose, they estimated generalized autoregressive conditional heteroscedasticity (GARCH) models under diagonal parameterization to estimate the multivariate GARCH framework also known as the BEKK model. The authors highlight that Russia is less vulnerable to external shocks. Finally, after examining the results in pairs, it is suggested that the stock indices of BRIC countries exhibited significant contagion due to the COVID-19 pandemic.

In more recent studies, authors Saijai et al. (2022) examined contagion effects in developed and emerging equity markets, debt markets, gold, and cryptocurrencies over the period January 2018 to July 2020 using multivariate GARCH models based on dynamic conditional correlations. The authors show that the returns exhibit high levels of persistence (greater than 0.80), except for the US stock market (DJI) and the gold market. When comparing the degree of contagion effects before and during COVID-19, the conditional correlation increases significantly after the pandemic announcement in many financial market pairs, indicating the contagion effects between these markets during the last months of the 2020 pandemic. However, it is observed that the dynamic correlations between

gold-DJI, Gold-Stock Exchange of Thailand (SET) and US Treasury Bill (TNX) are negative during the COVID-19 pandemic, indicating that gold may act as a safe haven in these financial markets.

In summary, this paper aims to contribute to providing information to investors and regulators in the Central and Eastern European capital markets where individual and institutional investors seek diversification benefits. Thus, the context of this paper is to examine the contagion between the stock indices under analysis, in order to understand whether the increase/decrease of financial integration causes or may cause shocks between these regional markets.

3. METHODOLOGY AND DATA

3.1. Data

The data used are the prices index of 9 capital markets under analysis, namely, the stock indices of Austria (Austrian Traded), Budapest (BUX), Bulgaria (SE SOFIX), Croatia (CROBEX), Russia (MOEX), Czech Republic (PragueSE PX), Romania (BET), Slovakia (SAX 16) and Slovenia (SBI TOP), for the period from January 2nd, 2017, to May 6th, 2022. The sample was partitioned into two sub-periods: the first sub-period comprises the days from January 2nd, 2017, to December 31st, 2019, which corresponds to the Tranquil period; while the second comprises the period from January 1st, 2020, to May 6th, 2022, which comprises the periods marked by high turbulence triggered by the 2020 pandemic occurrence and the Russian invasion of Ukraine in 2022, in which we refer to as Crisis. Quotes are daily and were obtained through the DataStream platform and are in local currency to avoid exchange rate distortions.

Table 1. The name of countries and their indices used in this paper

Country	Index
Austria	AUSTRIAN TRADED
Hungary	BUDAPEST BUX
Bulgaria	BULGARIA SE SOFIX
Croatia	CROBEX
Russia	MOEX
Czech Republic	PRAGUE SE PX
Romania	BET
Slovakia	SAX 16
Slovenia	BLUE CHIP SBI TOP

Source: Own elaboration

To analyse the behaviour of financial markets, Tsay (2005) proposes the use of return series instead of price series, because investors are mainly interested in knowing the return on an asset or a portfolio of assets. In addition, profitability series show statistical features that simplify the analytical treatment, namely the characteristic of stationarity, not usually present in price series. For the reasons explained above, the price indices series have been modified into growth rates or series in the differences of the Napierian logarithms of the current and previous returns, of logarithmic, instantaneous, or continuously compounded returns, through the following expression:

$$r_t = \ln P_t - \ln P_{t-1} \tag{1}$$

Where r_t is the rate of the return, at day t, and P_t and P_{t-1} are the closing prices of the series, at the moments t and $t-1$, respectively.

3.2. Methodology

The methodology used to answer the research questions is structured as follows: in the first stage we perform the descriptive statistics (mean, standard deviation, asymmetry and kurtosis), and to validate the time series distributions we use the Jarque and Bera (1980) test. To validate the assumptions of stationarity of the time series we used the unit root tests in panel by Breitung (2000), Levin, Lin, and Chu (2002), which postulate that the null hypothesis has unit roots, while the Hadri (2000) test presents the stationarity in the null hypothesis. The intersection of the tests will give robustness to the estimated models. In order to analyse the occurrence of financial contagion between the capital markets under analysis, the unconditional correlations were estimated, and the statistical significance of the estimated correlation coefficient was examined. For this purpose, the statistic t was used, which follows the distribution of t, with $n-2$ degrees of freedom, where r is the correlation coefficient between two series and n is the number of observations. In turn, to test whether the matrix of correlation coefficients is globally different from the identity matrix, we resort to the likelihood ratio test of Pindyck and Rotemberg (1990), whose null hypothesis postulates the non-existence of correlation between the various markets in the sample. The test statistic is given by $t = - N * Log [R]$, which is proved to follow a chi-square distribution, with 0.5p (p-1) degrees of freedom, where [R] is the determinant of the correlation matrix, N is the number of observations in the common sample and p is the number of series analysed in the test. To assess whether we are facing contagion or interdependence we estimate the Forbes and Rigobon (2002) t-test.

4.   RESULTS

Figure 1 shows the evolution, in first differences, of the 9 capital markets under analysis, namely, the stock indices of Austria (Austrian Traded), Budapest (BUX), Bulgaria (SE SOFIX), Croatia (CROBEX), Russia (MOEX), Czech Republic (Prague SE PX), Romania (BET), Slovakia (SAX 16) and Slovenia (SBI TOP), for the period from January 2nd, 2017 to May 6th, 2022, which comprises periods marked by high turbulence triggered by the occurrence of the COVID-19 pandemic and the Russian invasion of Ukraine. The time series returns reveal the instability experienced by the markets, with significant breaks in the time series being observed essentially during the year 2020, a period marked by the occurrence of the pandemic crisis. It should be noted that the Slovakian and Russian capital markets during this period were the markets that showed the least volatility, with comparatively less significant falls. Having said this, there was a tendency to rebalance during the year 2021. In 2022, there were structural breaks in the capital markets under analysis at the beginning 2022, with special emphasis on the Russian stock market index.

Figure 2 represents the evolution of the capital markets under analysis, in the first differences. The sample under study comprises a period from January 2nd, 2017, to May 6th, 2022, a rather complex period due to the outbreak triggered by the 2020 global pandemic (Covid-19) and more recently, due to the invasion of Ukraine by Russia. The returns reveal the instability experienced by these markets in February, March, and April 2020. During the first quarter of 2022, it can be observed that particularly the Russian stock market index, shows a rather sharp drop, less significantly, than the Budapest stock market index.
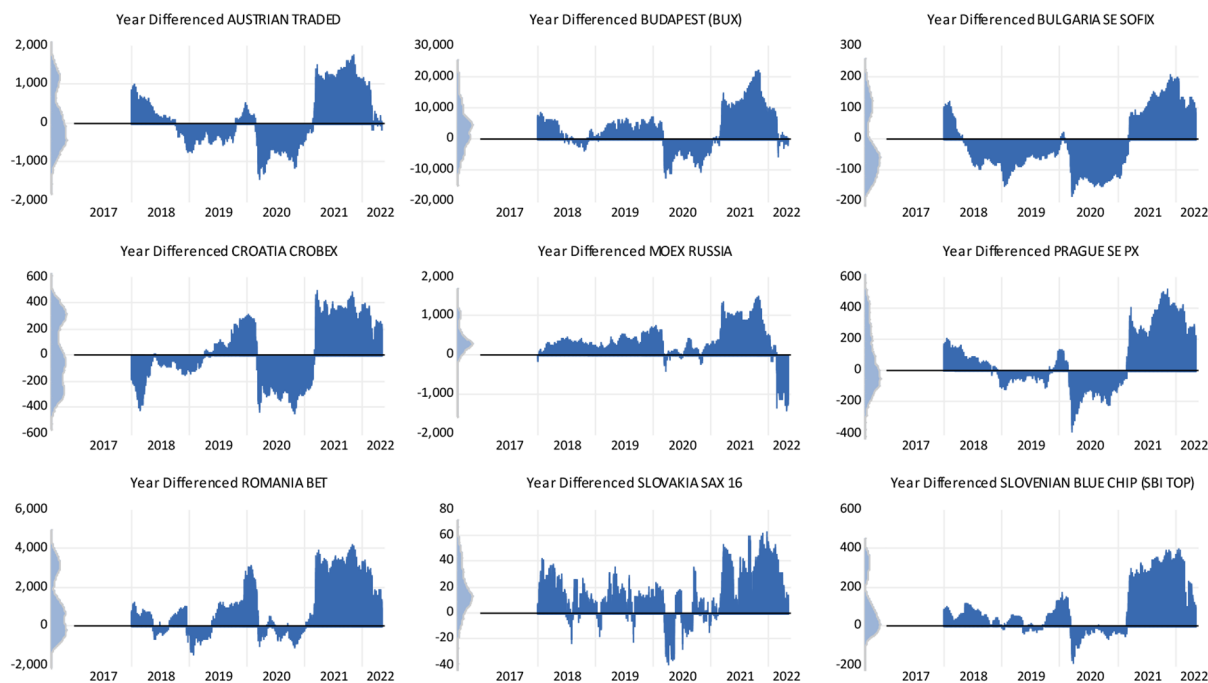
Figure 1. Evolution, in levels, of the 9 financial markets,
in the period January 2nd, 2017, to May 6th, 2022
Source: Own elaboration
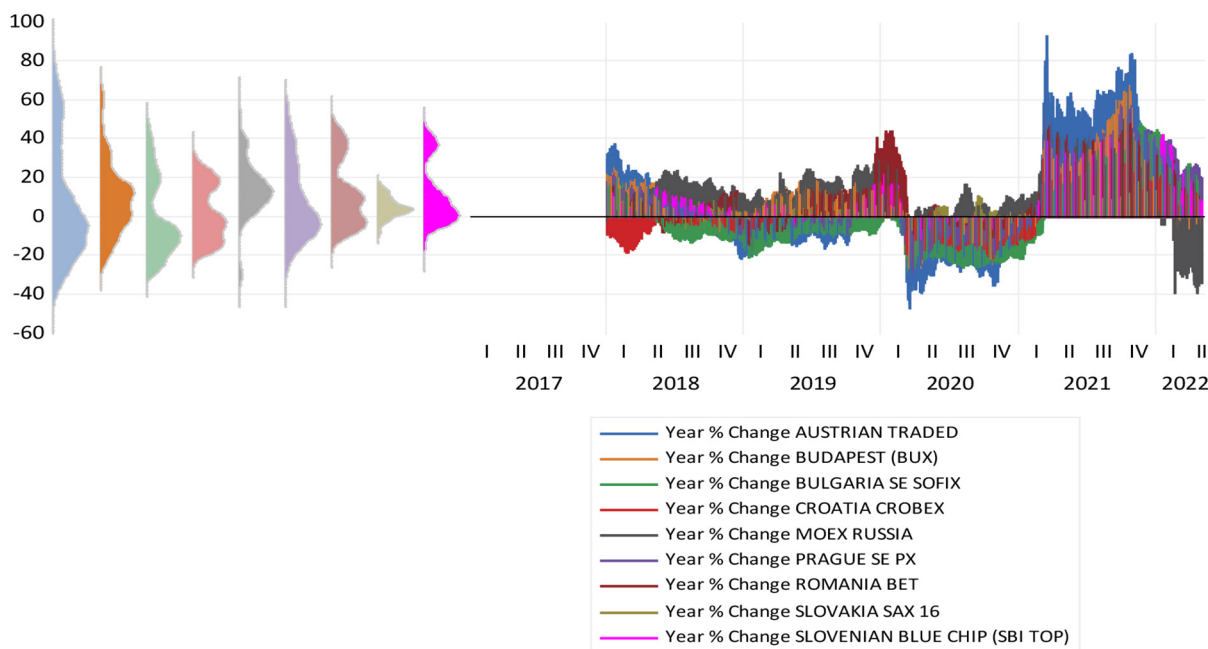
Note: DataStream

Figure 2. Evolution, Year % Change, of the 9 financial markets,
in the period January 2nd, 2017, to May 6th, 2022
Source: Own elaboration

In tables 2, 3, and 4 the stationary nature of the data series can be examined, referring to the 9 capital markets under analysis, namely, the stock market indices of Austria (Austrian Traded), Budapest (BUX), Bulgaria (SE SOFIX), Croatia (CROBEX), Russia (MOEX), Czech Republic (PragueSE PX), Romania (BET), Slovakia (SAX 16), and Slovenia (SBI TOP). The Breitung

(2000), Levin, Lin, and Chu (2002) tests postulate that the null hypothesis has unit roots, showing the stationarity of time series in first differences. The Hadri (2000) test, on the other hand, postulates stationarity in the null hypothesis and we can see that for a significance level of 1% the H_0 is validated in the first differences, showing that the data series are stationary, suggesting that we are facing a white noise (mean = 0; constant variance)

Table 2. Levin et al. (2002) test performed on the 9 capital markets under analysis over period January 2nd, 2017, to May 6th, 2022

Null Hypothesis: Unit root (common unit root process)

Method						Statistic	Prob.**
Levin, Lin & Chu t*						-111.196	0.0000

Intermediate results on D(UNTITLED)

Series	2nd Stage Coeff.	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
D(AUSTRIAN TRADED)	-0.94904	1456.0	41.953	0	23	70.0	1393
D(BUDAPEST BUX)	-0.92290	266119	16207.	2	23	34.0	1391
D(BULGARIA SE_SOFIX)	-0.87082	19.330	0.0588	2	23	670.0	1391
D(CROATIA CROBEX)	-0.68352	202.48	3.3914	4	23	169.0	1389
D(MOEX RUSSIA)	-1.12448	2095.7	42.693	0	23	103.0	1393
D(PRAGUE SE PX)	-0.98091	91.557	6.9707	0	23	26.0	1393
D(ROMANIA BET)	-0.85841	9469.3	42.194	1	23	530.0	1392
D(SLOVAKIA SAX 16)	-1.10561	10.518	0.1741	0	23	119.0	1393
D(SLOVENIAN BLUE CHIP SBI TOP)	-0.86932	63.625	1.3172	1	23	112.0	1392
	Coeff.	t-Stat	SE Reg	mu*	sig*		Obs
Pooled	-0.97920	-88.943	1.004	-0.500	0.707		12527

Note: * Automatic lag length selection based on SIC: 0 to 4. Newey-West automatic bandwidth selection and Bartlett kernel. ** Probabilities are computed assuming asymptotic normality.

Source: Own elaboration

Table 3. Breitung (2000) test performed on the 9 capital markets under analysis for the period January 2nd, 2017, to May 6th, 2022

Null Hypothesis: Unit root (common unit root process)

Method			Statistic	Prob.**
Breitung t-stat			-55.2754	0.0000

Intermediate regression results on D(UNTITLED)

Series	S.E. of Regression	Lag	Max Lag	Obs
D(AUSTRIAN TRADED)	52.6619	0	23	1393
D(BUDAPEST BUX)	583.006	2	23	1391
D(CROATIA CROBEX)	15.0320	4	23	1389
D(MOEX RUSSIA)	69.2338	0	23	1393
D(PRAGUE SE PX)	13.4113	0	23	1393
D(ROMANIA BET)	114.666	1	23	1392
D(SLOVAKIA SAX 16)	4.85148	0	23	1393
D(SLOVENIAN BLUE CHIP SBI TOP)	9.40043	1	23	1392
	Coefficient	t-Stat	SE Reg	Obs
Pooled	-0.54904	-55.275	0.010	12518

Note: * Automatic lag length selection based on SIC: 0 to 4. ** Probabilities are computed assuming asymptotic normality.

Source: Own elaboration

Table 4. Hadri (2000) test performed on the 9 capital markets under analysis
for the period January 2nd, 2017, to May 6th, 2022

Null Hypothesis: Stationarity				
Method			Statistic	Prob.**
Hadri Z-stat			-1.07307	0.8584
Heteroscedastic Consistent Z-stat			0.51081	0.3047
Series	LM	Variance HAC	Bandwidth	Obs
D(AUSTRIAN TRADED)	0.0844	2134.105	14.0	1394
D(BUDAPEST BUX)	0.0513	304245.8	11.0	1394
D(BULGARIA SE SOFIX)	0.1695	27.32660	14.0	1394
D(CROATIA CROBEX)	0.0310	366.8914	19.0	1394
D(MOEX RUSSIA)	0.1339	1961.207	6.0	1394
D(PRAGUE SE PX)	0.0851	127.4769	14.0	1394
D(ROMANIA BET)	0.0441	11496.70	5.0	1394
D(SLOVAKIA SAX 16)	0.0156	6.475281	16.0	1394
D(SLOVENIAN BLUE CHIP SBI TOP)	0.0492	98.34921	14.0	1394

Note: * High autocorrelation leads to severe size distortion in Hadri test, leading to over-rejection of the null. ** Probabilities are computed assuming asymptotic normality.

Source: Own elaboration

To analyse the occurrence of financial contagion between the stock market indices of Austria (Austrian Traded), Budapest (BUX), Bulgaria (SE SOFIX), Croatia (CROBEX), Russia (MOEX), Czech Republic (Prague SE PX), Romania (BET), Slovakia (SAX 16), and Slovenia (SBI TOP) over the period from January 2nd, 2017, to May 6th, 2022, we estimated the unconditional correlations and examined the statistical significance of the estimated correlation coefficient. For this purpose, we used the t statistic, which follows the distribution t, with $n - 2$ degrees of freedom, where r is the correlation coefficient between two series and n is the number of observations. In turn, to test whether the correlation coefficients matrix is globally different from the identity matrix, we resort to the likelihood ratio test of Pindyck and Rotemberg (1990), whose null hypothesis postulates the non-existence of correlation among the various markets in the sample. The test statistic is given by $t = - N * Log [R]$, which is proved to follow a chi-square distribution, with 0.5p (p-1) degrees of freedom, where [R] is the determinant of the correlation matrix, N is the number of observations in the common sample and p is the number of series analysed in the test.

Table 5. Correlation in the Tranquil period, concerning the 9 capital markets,
in the period from January 2nd, 2017, to December 31st, 2019

	AUSTRIAN	BUX	SOFIX	CROBEX	MOEX	PRAGUE	BET	SAX 16	SBI TOP
AUSTRIAN	-								
BUX	0.352840***	-							
SOFIX	0.106755***	0.086957***	-						
CROBEX	0.101463***	**0.036294**	0.120128***	-					
MOEX	0.333990***	0.225511***	0.060352*	**0.025779**	-				
PRAGUE	0.580227***	0.370233***	0.097964***	0.073565**	0.257412***	-			
BET	0.236308***	0.139268***	**0.051579**	0.092200***	0.084818**	0.263403***	-		
SAX16	**0.026347**	**0.033119**	**0.048260**	**0.031010**	**0.034153**	**0.009317**	**0.019745**	-	
SBI TOP	0.100261***	0.102279***	0.085161**	0.165258***	**0.007164**	0.115481***	0.096438***	**0.012068**	-

Note: ***, **, * indicate significant results at 1%, 5% and 10%, respectively.

Source: Own elaboration

In Table 5 we can observe the unconditional correlation coefficients of statistic t referring to the Tranquil period, in the period from January 2nd, 2017, to December 31st, 2019. As can be seen, in general, during the so-called quiet period in the financial markets, the markets show 60 significant correlation coefficients (out of 72 possible). On the other hand, market pairs AUSTRIAN-SAX 16, BUX- CROBEX, BUX-SAX 16, SOFIX-BET, SOFIX-SAX 16, COBEX-MOEX, CROBEX-SAX 16, MOEX-SAX 16, MOEX-SBI TOP, PRAGUE-SAX 16, BET-SAX 16, SAX 16-SBI TOP do not show significant correlation coefficients, which could mean the existence of risk diversification possibilities.

In table 6 we can see the unconditional correlation coefficients of the statistic t referring to the Crisis period, for the period from January 1st, 2020, to May 6th, 2022, and we can observe the existence of 65 markets with significant unconditional correlations, except for market pairs AUSTRIAN-SAX 16, BUX-SAX 16, SOFIX-SAX 16, CROBEX-SAX 16, MOEX-SAX 16, PRAGUE-SAX 16, BET-SAX 16, SAX 16-SBI TOP. Note that these non-correlations have already been seen in the Tranquil period; overall, the non-conditional correlations increased significantly which suggests that the 2020 global pandemic and the war in 2022 caused these regional markets to become more integrated.

Table 6. Correlation in the Crisis period, concerning the 9 capital markets, in the period from January 1st, 2020, to May 6th, 2022

	AUSTRIAN	BUX	SOFIX	CROBEX	MOEX	PRAGUE	BET	SAX 16	SBI TOP
AUSTRIAN	-								
BUX	0.713444***	-							
SOFIX	0.497778***	0.406416***	-						
CROBEX	0.636475***	0.589457***	0.509287***	-					
MOEX	0.457959***	0.479809***	0.155186***	0.396839***	-				
PRAGUE	0.777624***	0.635514***	0.457198***	0.590677***	0.435281***	-			
BET	0.618764***	0.531258***	0.488525***	0.610539***	0.328432***	0.624445***	-		
SAX 16	**-0.055256**	**-0.028632**	**0.025896**	**-0.007599**	**-0.028176**	**-0.043315**	**-0.010969**	-	
SBI TOP	0.539947***	0.505972***	0.523948***	0.679207***	0.354066***	0.530053***	0.540994***	0.021582	-

Note: ***, **, * indicate significant results at 1%, 5% and 10%, respectively.

Source: Own elaboration

Table 7 presents the results of Forbes and Rigobon's (2002) t-test to the contagion effect between the Tranquil and Crisis subperiods, the latter marked by the global pandemic of 2020 and the Russian invasion of Ukraine in 2022 and tested 72 pairs of markets to gauge whether increased correlations between markets resulted in contagion or interdependencies. The t-test results suggest that there are 62 pairs of markets showing significant contagion, except for SAX 16 - AUSTRIAN, SAX 16 - BUX, SAX 16 - SOFIX, SAX 16 - CROBEX, SAX 16 - MOEX, SAX 16 - PRAGUE, SAX 16 - BET, SAX 16 - SBI TOP, MOEX - AUSTRIAN, MOEX-PRAGUE. These results highlight that the global pandemic of 2020 and the Russian invasion of Ukraine in 2022 caused uncertainty in the global economy and consequences in the financial markets analysed; these findings validate that investors should exercise caution in risk diversification in these regional markets. These results are validated by authors Dias et al. (2021), Pardal et al. (2021), Dias, Heliodoro, Alexandre, Santos, and Vasco (2021), Dias and Carvalho (2021), Dias et al., (2022), Zebende et al. (2022) who evidence that the 2020 global pandemic caused shocks, commotions, persistence, and (in) efficiency, in its weak form, in global financial markets.

Table 7. Results of the contagion effect between the Tranquil / Crisis subperiods

Markets	t-Statistic	Results	Markets	t-Statistic	Results
AUSTRIAN - BUX	2.89***	**Contagion**	CROBEX - AUSTRIAN	2,21**	**Contagion**
AUSTRIAN - SOFIX	3.93***	**Contagion**	CROBEX - BUX	2.95***	**Contagion**
AUSTRIAN - CROBEX	3.91***	**Contagion**	CROBEX - SOFIX	4.14***	**Contagion**
AUSTRIAN - MOEX	3.27***	**Contagion**	CROBEX - MOEX	3.37***	**Contagion**
AUSTRIAN - PRAGUE	2.28**	**Contagion**	CROBEX - PRAGUE	2.27**	**Contagion**
AUSTRIAN - BET	3.44***	**Contagion**	CROBEX - BET	3.57**	**Contagion**
AUSTRIAN - SAX 16	2.89***	**Contagion**	CROBEX - SAX 16	4.75***	**Contagion**
AUSTRIAN - SBI TOP	3.92***	**Contagion**	CROBEX - SBI TOP	4.89***	**Contagion**
BUX - AUSTRIAN	2.04**	**Contagion**	MOEX - AUSTRIAN	0,91	No Contagion
BUX - SOFIX	3.95***	**Contagion**	MOEX - BUX	1.72*	**Contagion**
BUX - CROBEX	3.93***	**Contagion**	MOEX - SOFIX	3.22***	**Contagion**
BUX - MOEX	3.19***	**Contagion**	MOEX - CROBEX	3.18***	**Contagion**
BUX - PRAGUE	2,11**	**Contagion**	MOEX-PRAGUE	0.99	No Contagion
BUX - BET	3,39***	**Contagion**	MOEX - BET	2.47**	**Contagion**
BUX - SAX 16	4.57***	**Contagion**	MOEX - SAX 16	4.05***	**Contagion**
BUX - SBI TOP	4.11***	**Contagion**	MOEX - SBI TOP	3.42***	**Contagion**
SOFIX - AUSTRIAN	1.42*	**Contagion**	BET - AUSTRIAN	1.99**	**Contagion**
SOFIX - BUX	2.23**	**Contagion**	BET - BUX	2.75**	**Contagion**
SOFIX - CROBEX	3.61***	**Contagion**	BET - SOFIX	3.98***	**Contagion**
SOFIX - MOEX	2.71**	**Contagion**	BET - CROBEX	3.95***	**Contagion**
SOFIX - PRAGUE	1.49*	**Contagion**	BET - MOEX	3.17***	**Contagion**
SOFIX - BET	2.95***	**Contagion**	BET - PRAGUE	2.05**	**Contagion**
SOFIX - SAX 16	4.40***	**Contagion**	BET - SAX 16	4.62**	**Contagion**
SOFIX - SBI TOP	3.83***	**Contagion**	BET - SBI TOP	4.14***	**Contagion**
SAX 16 - AUSTRIAN	-3.43	No Contagion	SBI TOP - AUSTRIAN	2.02***	**Contagion**
SAX 16 - BUX	-3.51	No Contagion	SBI TOP - BUX	2.82***	**Contagion**
SAX 16 - SOFIX	-5.67	No Contagion	SBI TOP - SOFIX	4.15***	**Contagion**
SAX 16 - CROBEX	-4.30	No Contagion	SBI TOP - CROBEX	4.12***	**Contagion**
SAX 16 - MOEX	-3.02	No Contagion	SBI TOP - MOEX	3.28***	**Contagion**
SAX 16 - PRAGUE	-3.28	No Contagion	SBI TOP - PRAGUE	2.09*	**Contagion**
SAX 16 - BET	-3.92	No Contagion	SBI TOP - BET	3.51**	**Contagion**
SAX 16 - SBI TOP	-3.49	No Contagion	SBI TOP - SAX 16	4.83***	**Contagion**

Notes: Critical values correspond to a one-tailed significance on the right, 2.7638 (1%), 1.8125 (5%) and 1.3722 (10%). ***, **, * indicate significant results at 1%, 5% and 10%, respectively.

Source: Own elaboration

5. CONCLUSION

The general conclusion to be retained and supported by the results obtained through the econometric model tests is that the global pandemic of 2020 and the Russian invasion of Ukraine in 2022 had a significant impact on the memory properties of the Central and Eastern European financial markets. We found that the level of contagion is very significant, that is, in 72 contagion tests we verified the existence of 62 pairs of markets showing significant contagion, except for the pairs SAX 16 - AUSTRIAN, SAX 16 - BUX, SAX 16 - SOFIX, SAX 16 - CROBEX, SAX 16 - MOEX, SAX 16 - PRAGUE, SAX 16 - BET, SAX 16 - SBI TOP, MOEX - AUSTRIAN, MOEX-PRAGUE. This evidence may call into question the assumption of efficient portfolio diversification, meaning that investors in these regional markets should exercise caution when deciding to invest solely in these markets.

We believe that our empirical findings contribute considerably to the advancement of practices from the perspective of portfolio diversification. For academics, the results provide sufficient information for them to make reasonable comparisons with other situations and contexts, and they

can also gather ideas for further research in related areas. Investors can learn about the effect of global uncertainty on the stock market prices index in general and thus be able to make their investment decisions accordingly. Finally, the results of our study are useful for policymakers to identify which additional components and parameters should be analysed for the efficient functioning of stock markets and growth of the economy and thus be able to devise appropriate strategies. For future investigations, they may go through a larger sample of markets to estimate the synchronizations between oil price declines and volatility in stock markets.

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Impact of Russia's Invasion of Ukraine on Central and Eastern European Capital Markets

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Abstract: *On February 24th, 2022, Russia launched a full-scale military invasion against Ukraine, marking a sharp escalation to a conflict that began in 2014. Several analysts have called the invasion the largest military invasion in Europe since World War II. Considering these events this paper aims to test the efficient market hypothesis, in its weak form, in the capital markets of Hungary (BUX), Croatia (CROBEX), Russia (IMOEX), the Czech Republic (PX PRAGUE), Slovenia (SBITOP), and Poland (WIG) over the period from April 25th, 2017, to April 22nd, 2022. The results show that the random walk hypothesis is not supported by the analyzed financial markets in this period with the occurrence of the 2020 global pandemic and the Russian invasion of Ukraine. The values of the variance ratios are less than unity, implying that the returns are autocorrelated over time and mean-reverting, and no differences between the financial markets have been identified. This has implications for investors, since some returns may be expected, creating arbitrage opportunities and abnormal returns, contrary to the assumptions of random walk and informational efficiency. In conclusion, we believe that investors should eventually exercise some caution, at least while this uncertainty persists, and invest in less risky markets to mitigate risk and improve the efficiency of their portfolios.*

1. INTRODUCTION

On February 21st, 2022, Putin recognized the Donetsk People's Republic and the Lugansk People's Republic, two self-proclaimed regions as states, controlled by pro-Russian separatists in Donbas. The next day, the Russian Federation Council unanimously authorized the use of military force and Russian troops entered both territories. On February 24th, Putin announced a "special military operation," supposedly to "demilitarize" and "denazify" Ukraine. Minutes later, missiles struck sites across Ukrainian territory, including Kiev, the capital. The Ukrainian Border Guard reported attacks on border crossings with Russia and Belarus. Shortly thereafter, Russian ground forces entered Ukraine. Ukrainian President Volodymyr Zelensky promulgated martial law and called for a general mobilization in the country.

Considering these events, it is pertinent to evaluate the crashes resulting from these events, as well as to test whether the capital markets of Hungary (BUX), Croatia (CROBEX), Russia (IMOEX), the Czech Republic (PX PRAGUE), Slovenia (SBITOP), and Poland (WIG), show signs of (in) efficiency due to uncertainty in the global economy in 2022. The results show that the

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capital markets, for the most part, exhibit significant structure breakdowns in March 2022 and that they are not efficient, in their weak form. These findings carry implications for investors, as some returns may be expected, creating opportunities for arbitrage and returns above market average without incurring additional risk.

In terms of structure, this paper is organized into 5 sections. Section 1 is represented by the current introduction. Section 2 presents a Literature Review of articles on the efficient market hypothesis in international financial markets. Section 3 describes the methodology and data. Section 4 contains the results. Section 5 refers to conclusions.

2. LITERATURE REVIEW

The European stock market is characterized by enormous connectivity between the different domestic markets in the region. These markets are also quite relevant because of their global financial importance. Authors such as Smith and Ryoo (2003), Borges (2010), Borges (2011), Sensoy and Tabak (2015), Caporale, Gil-Alana, and Poza (2020), Milos, Hatiegan, Milos, Barna, and Botoc (2020) have presented individual or group studies of the efficiency hypothesis, in its weak form, in various stock markets in Europe.

Borges (2010, 2011) has done extensive work on the European market and the study of its efficiency, at the weak form level. Borges (2010) tested the market efficiency in the main indices of the UK, France, Germany, Greece, and Portugal over the period 1993 to 2007. The results were not uniform, for the analysis of daily data the efficiency hypothesis for Portugal and Greece is rejected; however, after 2003 these two indices start to follow a martingale (heteroscedastic) behavior, that is, past price behavior does not help to predict future price fluctuations. Borges (2011) tests the random walk hypothesis, through the main Portuguese index, the PSI-20 in the period from 1993 to 2006. The results indicate that the Portuguese market from 2000 onwards has been showing behavior similar to the random walk hypothesis, which means that the Portuguese market has become more efficient, in its weak form, in recent years.

Caporale, Gil-Alana, and Poza (2020), Milos, Hatiegan, Milos, Barna, and Botoc (2020) tested market efficiency, in its weak form, in the capital markets of Europe. Caporale, Gil-Alana, and Poza (2020) analyzed the stock markets of Germany, the UK, France, Italy, and Spain, showing the presence of long memories, which may be disruptive to the market efficiency hypothesis, in its weak form. Milos, Hatiegan, Milos, Barna, and Botoc (2020) analyzed several Central and Eastern European markets. The results indicate that returns exhibited long-run correlations, which indicates that the stock markets under study reject the random walk hypothesis.

Pardal et al. (2021) analyzed the impact of the 2020 global pandemic on the banking sectors in the countries of the Czech Republic, Hungary, Poland, Romania, Russia, and Slovakia for the period from January 2nd, 2017, to August 10th, 2020. The authors show that the markets do not have the characteristics for an efficient diversification of portfolios. Meanwhile, the authors Dias, Heliodoro, Alexandre, Santos, and Vasco (2021) analyzed efficiency, in its weak form, in the foreign exchange markets in the period from September 3rd, 2018 to October 20th, 2020, suggesting persistence in these markets, showing the existence of high levels of arbitrage, i.e., investors may obtain returns above the market average without incurring in additional risk, which could compromise the implementation of efficient portfolio diversification strategies due to market imbalances.

In more recent studies, Zebende et al. (2022) analyzed market efficiency, in its weak form, in G-20 capital markets with intraday data from May 2019 to May 2020. To answer the research questions, they applied the DFA and DCCA methods, to identify or not two points: i) are the G-20 stock markets efficient, in their weak form? ii) with the opening/closing quotes, is it possible to identify any kind of memory in the G-20 capital markets? For this purpose, the authors divided the sample into two distinct time scales: period I, a time scale of less than five days, and period II, with a time scale of more than ten days. For the period of the 2020 global pandemic, the authors show that for time frames of less than 5 days, stock markets tend to be efficient, while for time frames longer than 10 days, stock markets tend to be inefficient. Meanwhile, Dias et al. (2022) measured capital market efficiency in Botswana, Egypt, Kenya, Morocco, Nigeria, South Africa, Japan, the UK, and the US over the period September 2nd, 2019, to September 2nd, 2020, suggesting that the random walk hypothesis is rejected and that investors with adjusted trading strategies will be able to achieve above average returns without incurring additional risk.

In summary, this paper aims to contribute to providing information to investors and regulators in Europe's equity markets where individual and institutional investors seek diversification benefits, as well as help promote the implementation of policies that contribute to the efficiency of these markets. Therefore, the context of this paper is to examine the market efficiency, in its weak form, and the predictability of these capital markets in this period of uncertainty in the global economy arising from the Russian invasion of Ukraine in 2022.

3. METHODOLOGY AND DATA

3.1. Data

The data analyzed are the prices index of 6 capital markets, namely, the stock indices of Hungary (BUX), Croatia (CROBEX), Russia (IMOEX), Czech Republic (PX PRAGUE), Slovenia (SBITOP), and Poland (WIG), for the period from April 25th, 2017, to April 22nd, 2022. The price indices are daily and were obtained from the Thomson Reuters Eikon platform and are in local currency, to mitigate exchange rate distortions.

3.2. Methodology

The development of this research will take place in several stages. In the first stage, descriptive statistical measures will be used, as well as the Jarque and Bera (1980) goodness-fit test, to verify that the data follow a normal distribution. In the second stage, we will elaborate graphics, in levels, and in returns, to measure the evolution of the capital markets under analysis. To estimate stationarity, we will use the Levin, Lin, and Chu (2002), Im, Pesaran, and Shin (2003) test which postulates that the null hypothesis has unit roots, while the Hadri (2000) test, postulates stationarity under the null hypothesis; the interception of unit root tests will allow us to assess whether the time series has the characteristics of white noise. To validate the presence, or not, of structural breaks we will use the Clemente et al. (1998) test. This model will indicate the most significant crash, despite the existence of other breaks during the sample period.

In order to answer the research question, we will use the non-parametric test developed by Wright (2000), once it is a more resilient test to time series that do not exhibit normality and is quite consistent when they exhibit serial correlation. This author's methodology consists of two types of tests, the Rankings test for homoscedastic series and the Signs test for heteroscedastic series.

The variance (Rankings) test is based on the ordering of the yield series. We consider $r(r_t)$ as the profitability position, r_t, between $r_1, r_2, \ldots, r_T$:

$$r'_{1t} = \frac{\left(r(r_t) - \frac{T+1}{2}\right)}{\sqrt{\frac{\frac{(T-1)(T+1)}{2}}{12}}} \tag{1}$$

$$r'_{2t} = \Phi^{-1}\left(\frac{r(r_t)}{T+1}\right) \tag{2}$$

Where Φ^{-1} translates that the cumulative inverse standardized normal distribution, r'_{2t} is a standardized linear transformation of the position of the returns and r'_{2t} is a standardized inverse normal transformation. Where translates that the cumulative inverse standardized normal distribution, is a standardized linear transformation of the position of the returns and is a standardized inverse normal transformation.

$$R_1(q) = \left(\frac{\frac{1}{Tq}\sum_{t=q+1}^{T}(r'_{1t} + r'_{1t-1} + \cdots + r'_{1t-q})^2}{\frac{1}{T}\sum_{t=q+1}^{T}(r'_{1t})^2}\right) \times \left(\frac{2(2q-1)(q-1)}{3qT}\right)^{-1/2} \tag{3}$$

$$R_2(q) = \left(\frac{\frac{1}{Tq}\sum_{t=q+1}^{T}(r'_{2t} + r'_{2t-1} + \cdots + r'_{2t-q})^2}{\frac{1}{T}\sum_{t=q+1}^{T}(r'_{2t})^2}\right) \times \left(\frac{2(2q-1)(q-1)}{3qT}\right)^{-1/2} \tag{4}$$

The rejection of the random walk hypothesis of the returns is generated by a simulation process, where the values of the statistics r'_{1t} and r'_{2t} are replaced by the simulated values r'^*_{1t} and r'^*_{2t}. Using bootstrap estimates, which result in the successive random generation of data, to simulate the statistical properties of the true sample distribution, the exact distribution of $R_1(q)$ and $R_2(q)$ can be approximated to a certain confidence level.

Wright's (2000) methodology proposes a second test, called sign-variance ratio, which considers the sign of the returns, r_t, to calculate the sign ratio, and it is heteroscedastic, so we can use the following test statistic, as follows:

$$S_1(q) = \left(\frac{\frac{1}{Tq}\sum_{t=q+1}^{T}(S_t + S_{t-1} + \cdots + S_{t-q})^2}{\frac{1}{T}\sum_{t=q+1}^{T}(S_t)^2}\right) \times \left(\frac{2(2q-1)(q-1)}{3qT}\right)^{-1/2} \tag{5}$$

Where,

$$S_t = 2v(r_t, 0) \tag{6}$$

$$v(x_t, p) = \begin{cases} 0.5 & x_t > p \\ -0.5 & x_t \le p \end{cases}$$

The distribution of $S_1(q)$ can be approximated by $S_1^*(q)$ using bootstrap techniques, as was done for the variance ratio by rank. $S_1^*(q)$ is obtained from the sequence $\{S_t^*\}_{(t=1)}^T$, as each of its elements being able to register the values 1 or −1, with equal probability.

4. RESULTS

Figure 1 shows the evolution, in levels, of the 6 capital markets under analysis, namely, the Hungarian (BUX), Croatian (CROBEX), Russian (IMOEX), Czech (PX PRAGUE), Slovenian (SBITOP), and Polish (WIG) stock indices. From the graphical analysis we can verify the existence of structural breaks in 2020 and 2022, due to the global pandemic of 2020 and the Russian

invasion of Ukraine. This evidence is validated by the authors Dias et al. (2022), Zebende et al. (2022) who show significant structural breaks in international capital markets. Figure 2 shows the evolution, in terms of returns, of the 6 stock markets under analysis and we can see the existence of extreme volatility, and the existence of a bear market period, between February, March and April 2020, characterized by a sharp drop in the index prices, due to the evolution of the global pandemic (Covid-19), and in 2022 due to the Russian invasion of Ukraine.
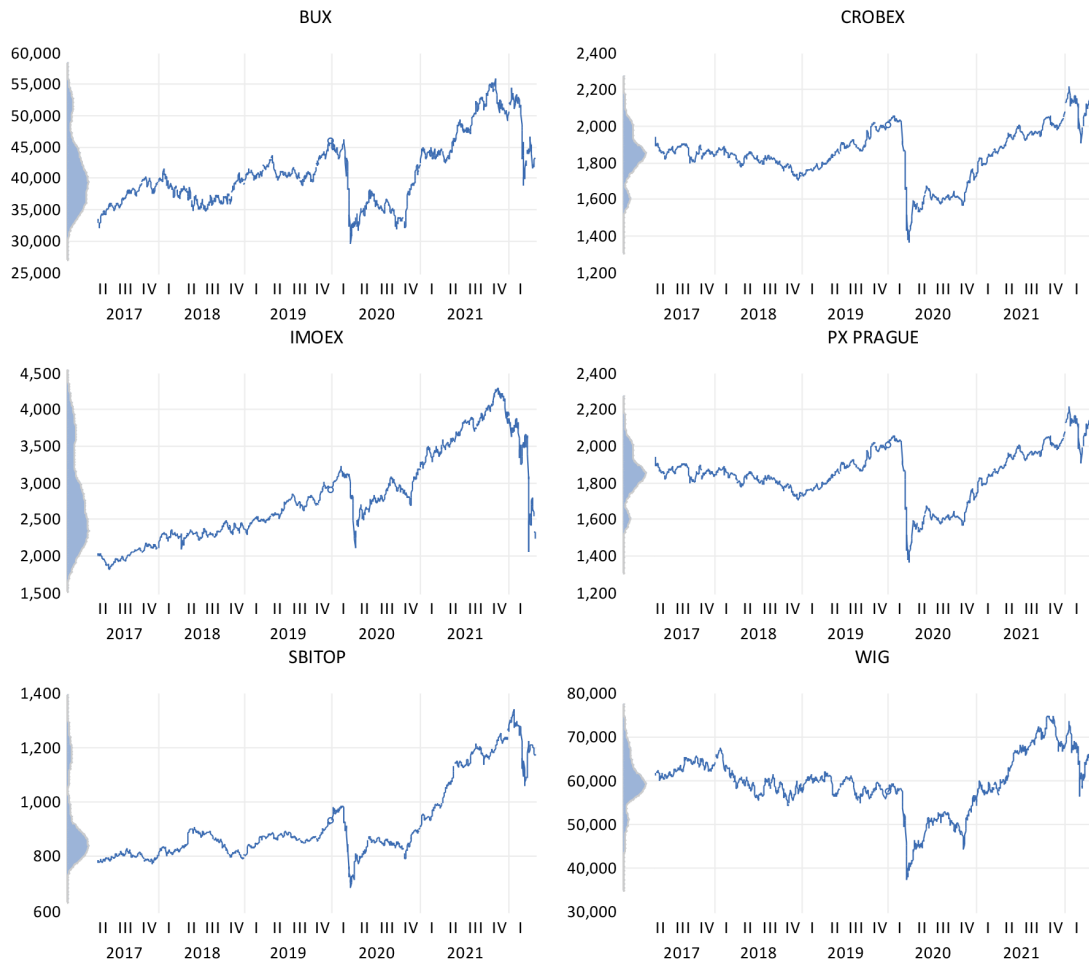
Figure 1. Evolution, in levels, of the 6 capital markets for the period April 25th, 2017, to April 22nd, 2022

Source: Own elaboration
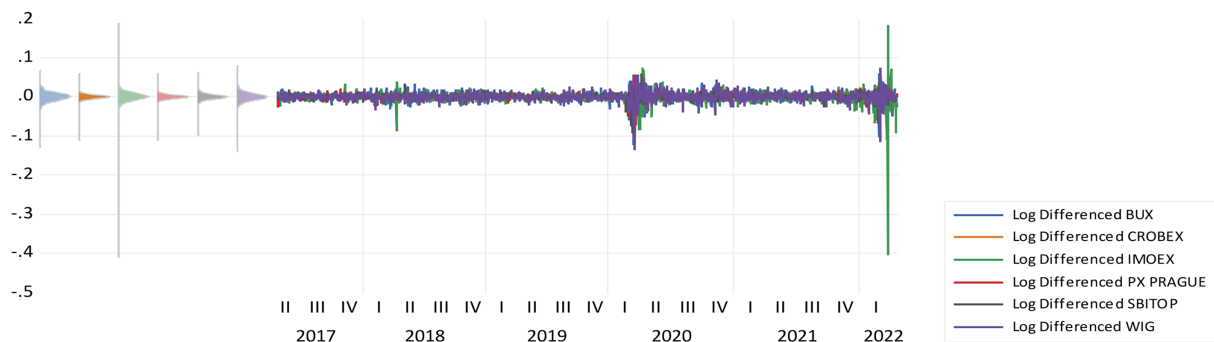
Figure 2. Evolution of returns of the 6 capital markets, in the period from April 25th, 2017, to April 22nd, 2022

Source: Own elaboration

Table 1 shows the main descriptive statistics of the 6 capital markets under analysis, namely, the Hungarian (BUX), Croatian (CROBEX), Russian (IMOEX), Czech (PX PRAGUE), Slovenian (SBITOP), and Polish (WIG) stock market indices, for the period from April 25th, 2017, to April 22nd, 2022. From the analysis we can see that the average returns are positive, except for the Polish stock market (WIG), while the market with the highest standard deviation is Russia (0.018017). The skewness of the time series is negative, most notably in the IMOEX index (-8.832515), while the kurtosis is greater than 3, which means the skewness and kurtosis coefficients are statistically different from those of a normal distribution.

Table 1. Descriptive statistics, in returns, of the 6 capital markets for the period April 25th, 2017, to April 22nd, 2022

	BUX	CROBEX	IMOEX	PX PRAGUE	SBITOP	WIG
Mean	0.000204	7.85E-05	8.90E-05	7.78E-05	0.000332	-3.68E-06
Median	0.000734	0.000356	0.000913	0.000356	0.000435	0.000107
Maximum	0.060033	0.056229	0.182620	0.056229	0.059589	0.074326
Minimum	-0.122684	-0.107323	-0.404674	-0.107323	-0.093825	-0.135265
Std. Dev.	0.013565	0.008276	0.018017	0.008276	0.008938	0.012624
Skewness	-1.679062	-3.909550	-8.832515	-3.909221	-2.026151	-1.644696
Kurtosis	17.91385	53.31174	218.3426	53.30916	24.74132	21.73712
Jarque-Bera	12103.71	134265.2	2417867.	134251.2	25331.61	18743.40
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Observations	1243	1243	1243	1243	1243	1243

Source: Own elaboration

In tables 2, 3 and 4 we can examine the stationary nature of the data series, referring to the 6 capital markets under analysis, namely, the Hungarian (BUX), Croatian (CROBEX), Russian (IMOEX), Czech (PX PRAGUE), Slovenian (SBITOP), and Polish (WIG) stock indices. The Levin, Lin, and Chu (2002), Im, Pesaran, and Shin (2003) test postulate that the null hypothesis has unit roots, showing the stationarity of time series in first differences. The Hadri (2000) test, on the other hand, postulates stationarity in the null hypothesis and we can see that the stationarity hypothesis is validated in the first differences, showing that the data series are stationary, suggesting that we are facing a white noise (mean = 0; constant variance).

Table 2. Levin, Lin, and Chu (2002) stationarity test concerning the 6 capital markets for the period from April 25th, 2017, to April 22nd, 2022

Method			Statistic		Prob.**	
Levin, Lin & Chu t*			-78.7569		0.0000	
** Probabilities are computed assuming asymptotic normality						
Intermediate results on D(UNTITLED)						
	2nd Stage	Variance	HAC of		Max	Band-	
Series	Coefficient	of Reg	Dep.	Lag	Lag	width	Obs
D(BUX)	-0.90795	288598	7974.3	2	22	76.0	1238
D(CROBEX)	-0.74826	195.61	5.0673	2	22	81.0	1238
D(IMOEX)	-1.11734	2318.1	21.142	0	22	238.0	1240
D(PX PRAGUE)	-0.74826	195.61	5.0673	2	22	81.0	1238
D(SBITOP)	-0.86656	69.744	0.9807	1	22	162.0	1239
D(WIG)	-0.99787	479519	5627.6	0	22	180.0	1240
	Coefficient	t-Stat	SE Reg	mu*	sig*		Obs
Pooled	-0.95456	-63.189	1.005	-0.500	0.707		7433

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

Source: Own elaboration

Table 3. Im et al. (2003) stationarity test concerning the 6 capital markets for the period April 25th, 2017, to April 22nd, 2022

Method						Statistic	Prob.**
Im, Pesaran and Shin W-stat						-64.8304	0.0000

** Probabilities are computed assuming asymptotic normality

Intermediate ADF test results

Series	t-Stat	Prob.	E(t)	E(Var)	Lag	Max Lag	Obs
D(BUX)	-18.316	0.0000	-1.514	0.754	2	22	1238
D(CROBEX)	-15.755	0.0000	-1.514	0.754	2	22	1238
D(IMOEX)	-39.583	0.0000	-1.532	0.735	0	22	1240
D(PX PRAGUE)	-15.755	0.0000	-1.514	0.754	2	22	1238
D(SBITOP)	-21.790	0.0000	-1.530	0.745	1	22	1239
D(WIG)	-35.112	0.0000	-1.532	0.735	0	22	1240
Average	-24.385		-1.523	0.746			

Source: Own elaboration

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

Table 4. Hadri's (2000) stationarity test concerning the 6 capital markets for the period April 25th, 2017, to April 22nd, 2022.

Method		Statistic	Prob.**
Hadri Z-stat		-1.62866	0.9483
Heteroscedastic Consistent Z-stat		-0.69101	0.7552

* Note: High autocorrelation leads to severe size distortion in Hadri test, leading to over-rejection of the null.

** Probabilities are computed assuming asymptotic normality

Intermediate results on D(UNTITLED)

Series	LM	Variance HAC	Bandwidth	Obs
D(BUX)	0.0585	338068.0	11.0	1241
D(CROBEX)	0.1289	352.5232	18.0	1241
D(IMOEX)	0.2773	2259.988	9.0	1241
D(PX PRAGUE)	0.1289	352.5232	18.0	1241
D(SBITOP)	0.0816	107.6805	13.0	1241
D(WIG)	0.0725	518298.4	6.0	1241

Source: Own elaboration

In figure 3 we can observe the most significant structure breaks in the capital markets of Hungary (BUX), Croatia (CROBEX), Russia (IMOEX), Czech Republic (PX PRAGUE), Slovenia (SBITOP), and Poland (WIG) during the period from April 25th, 2017, to April 22nd, 2022.

The test results of Clemente et al. (1998) show that the crashes occurred on different dates, namely in 2017 and 2022; however, we also see crashes in the first months of 2020, but those were not the most significant crashes. The stock markets of Croatia (CROBEX), the Czech Republic (PX PRAGUE), and Slovenia (SBITOP), show the most significant structural breaks in May 2017, while the stock indices of Hungary (BUX), Russia (IMOEX), and Poland (WIG) break sharply in March 2022. These results are in line with events that occurred on February 24th, 2022, when Russia launched a full-scale military invasion against Ukraine, one of its neighbors to the southwest, marking a sharp escalation of a conflict that began in 2014.

In Table 5 are presented the results of the nonparametric version of Wright's (2000) variance test, which includes the Rankings and Signs Variance Ratios tests. In both cases, the statistics were calculated for lags of 2 to 16 days. The time series represent the capital markets of Hungary (BUX), Croatia (CROBEX), Russia (IMOEX), the Czech Republic (PX PRAGUE), Slovenia

(SBITOP), and Poland (WIG) over the period from April 25th, 2017, to April 22nd, 2022. Based on the Rank Score Variance Ratio test and the Sign Variance Ratio test, we can see that the random walk hypothesis is rejected in all stock markets; we find that the values of the variance ratios are less than unity, which implies that the returns exhibit significant autocorrelation. Under these conditions, markets tend to overreact to information, eventually correcting it in the following days, whether it is good news or bad news. The high price sensitivity to the arrival of new information may have been due to the climate of pessimism and uncertainty experienced by investors during the sample period. These findings are validated by Dias, Heliodoro, Teixeira, and Godinho (2020), Dias, Santos, et al. (2021), Dias, Alexandre, et al. (2021), Dias, Heliodoro, et al. (2021), Zebende et al. (2022), Dias et al. (2022).
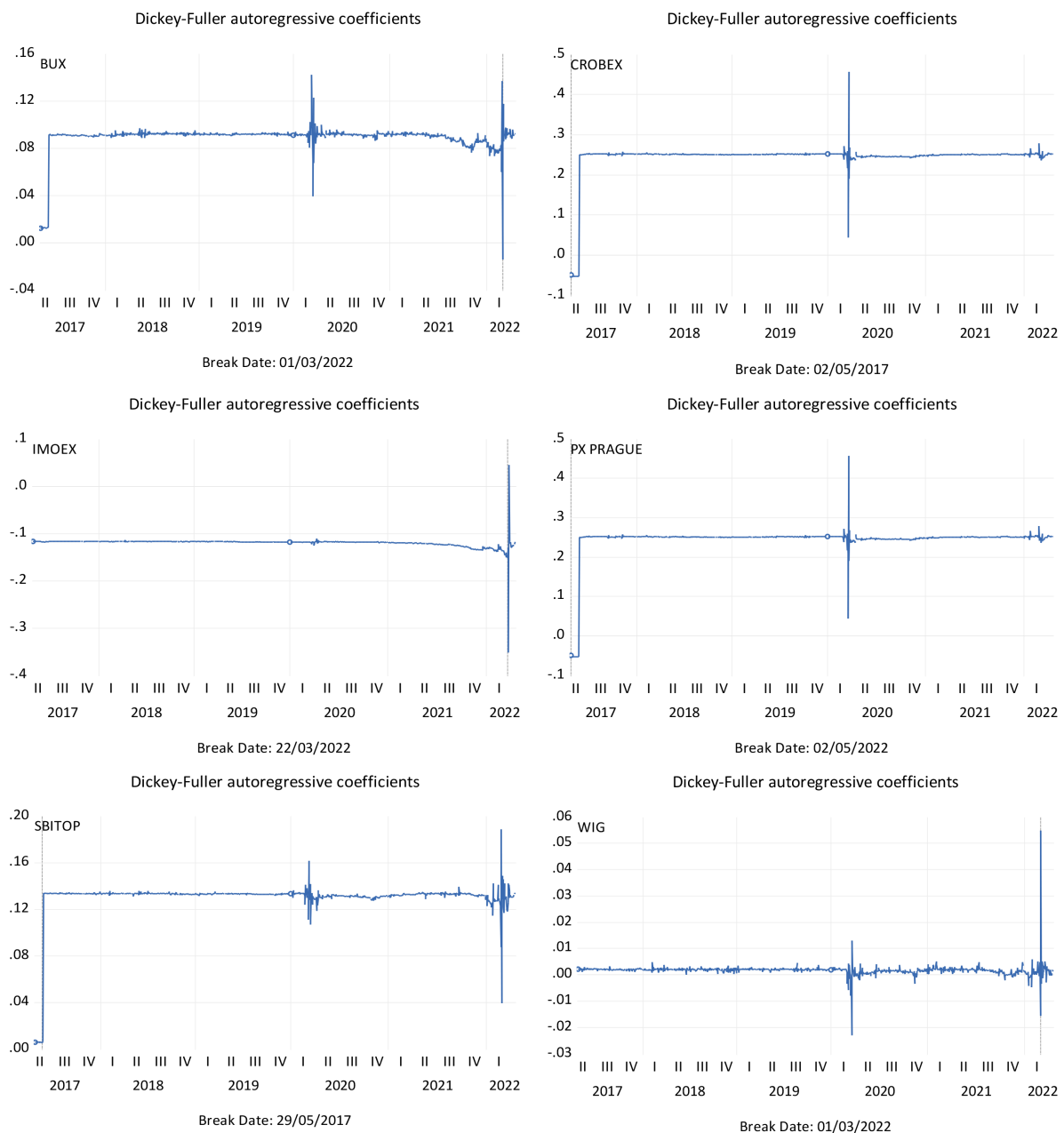
Figure 3. Stationarity tests with Clemente et al. (1998) structure breaks on returns, concerning the 6 capital markets, for the period from April 25th, 2017, to April 22nd, 2022

Source: Own elaboration

Table 5. Tests of Wright's (2000) Variance Ratios of Rankings and Signals, in returns, concerning the 6 capital markets, for the period from April 25th, 2017, to April 22nd, 2022

Null Hypothesis: BUX is a random walk (Rank Score Variance Ratio)

Joint Tests	Value	df	Probability
Max |z| (at period 2)	15.39338	1241	0.0000
Wald (Chi-Square)	308.9323	15	0.0000

Individual Tests			
Period	Var. Ratio	Std. Error	z-Statistic	Probability
---	---	---	---	---
2	0.563034	0.028387	-15.39338	0.0000
3	0.352490	0.042316	-15.30166	0.0000
4	0.277035	0.053107	-13.61348	0.0000
5	0.239133	0.062192	-12.23416	0.0000
6	0.214908	0.070174	-11.18784	0.0000
7	0.174045	0.077369	-10.67553	0.0000
8	0.166874	0.083969	-9.921853	0.0000
9	0.154280	0.090098	-9.386639	0.0000
10	0.142905	0.095844	-8.942571	0.0000
11	0.134406	0.101270	-8.547369	0.0000
12	0.118853	0.106424	-8.279622	0.0000
13	0.120160	0.111342	-7.902172	0.0000
14	0.107677	0.116053	-7.688895	0.0000
15	0.108104	0.120583	-7.396532	0.0000
16	0.106183	0.124950	-7.153416	0.0000

Null Hypothesis: BUX is a martingale (Sign Variance Ratio Test)

Joint Tests	Value	df	Probability
Max |z| (at period 2)	10.24758	1241	0.0000
Wald (Chi-Square)	131.5036	15	0.0000

Individual Tests			
Period	Var. Ratio	Std. Error	z-Statistic	Probability
---	---	---	---	---
2	0.709106	0.028387	-10.24758	0.0000
3	0.582057	0.042316	-9.876628	0.0000
4	0.512490	0.053107	-9.179847	0.0000
5	0.472683	0.062192	-8.478847	0.0000
6	0.444803	0.070174	-7.911762	0.0000
7	0.416600	0.077369	-7.540498	0.0000
8	0.407736	0.083969	-7.053382	0.0000
9	0.391172	0.090098	-6.757374	0.0000
10	0.375181	0.095844	-6.519098	0.0000
11	0.365028	0.101270	-6.270074	0.0000
12	0.347838	0.106424	-6.127983	0.0000
13	0.343458	0.111342	-5.896651	0.0000
14	0.334753	0.116053	-5.732246	0.0000
15	0.332796	0.120583	-5.533153	0.0000
16	0.323731	0.124950	-5.412334	0.0000

Null Hypothesis: CROBEX is a random walk (Rank Score Variance Ratio)

Joint Tests	Value	df	Probability
Max |z| (at period 2)	16.53611	1241	0.0000
Wald (Chi-Square)	287.2557	15	0.0000
Individual Tests			

Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	0.530595	0.028387	-16.53611	0.0000
3	0.359361	0.042316	-15.13928	0.0000
4	0.285767	0.053107	-13.44905	0.0000
5	0.233669	0.062192	-12.32201	0.0000
6	0.208093	0.070174	-11.28496	0.0000
7	0.183544	0.077369	-10.55276	0.0000
8	0.163079	0.083969	-9.967039	0.0000
9	0.143412	0.090098	-9.507262	0.0000
10	0.129609	0.095844	-9.081300	0.0000
11	0.125272	0.101270	-8.637563	0.0000
12	0.116834	0.106424	-8.298593	0.0000
13	0.112543	0.111342	-7.970583	0.0000
14	0.100979	0.116053	-7.746609	0.0000
15	0.094906	0.120583	-7.505991	0.0000
16	0.094294	0.124950	-7.248568	0.0000

Null Hypothesis: CROBEX is a martingale (Sign Variance Ratio Test)

Joint Tests	Value	df	Probability
Max |z| (at period 2)	11.43982	1241	0.0000
Wald (Chi-Square)	135.3006	15	0.0000
Individual Tests			

Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	0.675262	0.028387	-11.43982	0.0000
3	0.554123	0.042316	-10.53676	0.0000
4	0.501209	0.053107	-9.392274	0.0000
5	0.463658	0.062192	-8.623961	0.0000
6	0.446414	0.070174	-7.888797	0.0000
7	0.434097	0.077369	-7.314342	0.0000
8	0.422240	0.083969	-6.880646	0.0000
9	0.411944	0.090098	-6.526828	0.0000
10	0.406446	0.095844	-6.192890	0.0000
11	0.404879	0.101270	-5.876567	0.0000
12	0.405855	0.106424	-5.582824	0.0000
13	0.403955	0.111342	-5.353304	0.0000
14	0.398296	0.116053	-5.184712	0.0000
15	0.392103	0.120583	-5.041317	0.0000
16	0.388598	0.124950	-4.893189	0.0000

Null Hypothesis: IMOEX is a random walk (Rank Score Variance Ratio)

Joint Tests	Value	df	Probability
Max |z| (at period 2)	16.28978	1241	0.0000
Wald (Chi-Square)	269.8408	15	0.0000
Individual Tests			

Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	0.537588	0.028387	-16.28978	0.0000
3	0.378394	0.042316	-14.68952	0.0000
4	0.282109	0.053107	-13.51794	0.0000
5	0.227304	0.062192	-12.42436	0.0000
6	0.198489	0.070174	-11.42182	0.0000
7	0.181024	0.077369	-10.58533	0.0000
8	0.171787	0.083969	-9.863340	0.0000
9	0.161911	0.090098	-9.301939	0.0000
10	0.150869	0.095844	-8.859484	0.0000
11	0.144551	0.101270	-8.447190	0.0000
12	0.138369	0.106424	-8.096233	0.0000
13	0.134383	0.111342	-7.774428	0.0000
14	0.131503	0.116053	-7.483594	0.0000
15	0.128559	0.120583	-7.226899	0.0000
16	0.129416	0.124950	-6.967478	0.0000

Null Hypothesis: IMOEX is a martingale (Sign Variance Ratio Test)

Joint Tests	Value	df	Probability
Max |z| (at period 2)	11.26950	1241	0.0000
Wald (Chi-Square)	135.6293	15	0.0000
Individual Tests			

Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	0.680097	0.028387	-11.26950	0.0000
3	0.569165	0.042316	-10.18131	0.0000
4	0.504432	0.053107	-9.331580	0.0000
5	0.463658	0.062192	-8.623961	0.0000
6	0.443191	0.070174	-7.934728	0.0000
7	0.431334	0.077369	-7.350051	0.0000
8	0.418614	0.083969	-6.923830	0.0000
9	0.404065	0.090098	-6.614276	0.0000
10	0.402256	0.095844	-6.236609	0.0000
11	0.397260	0.101270	-5.951796	0.0000
12	0.398335	0.106424	-5.653493	0.0000
13	0.394533	0.111342	-5.437923	0.0000
14	0.390699	0.116053	-5.250178	0.0000
15	0.388665	0.120583	-5.069830	0.0000
16	0.389807	0.124950	-4.883515	0.0000

Null Hypothesis: PX PRAGUE is a random walk (Rank Score Variance Ratio)

Joint Tests	Value	df	Probability
Max |z| (at period 2)	16.53611	1241	0.0000
Wald (Chi-Square)	287.2557	15	0.0000
Individual Tests			
Period	Var. Ratio	Std. Error	z-Statistic	Probability
---	---	---	---	---
2	0.530595	0.028387	-16.53611	0.0000
3	0.359361	0.042316	-15.13928	0.0000
4	0.285767	0.053107	-13.44905	0.0000
5	0.233669	0.062192	-12.32201	0.0000
6	0.208093	0.070174	-11.28496	0.0000
7	0.183544	0.077369	-10.55276	0.0000
8	0.163079	0.083969	-9.967039	0.0000
9	0.143412	0.090098	-9.507262	0.0000
10	0.129609	0.095844	-9.081300	0.0000
11	0.125272	0.101270	-8.637563	0.0000
12	0.116834	0.106424	-8.298593	0.0000
13	0.112543	0.111342	-7.970583	0.0000
14	0.100979	0.116053	-7.746609	0.0000
15	0.094906	0.120583	-7.505991	0.0000
16	0.094294	0.124950	-7.248568	0.0000

Null Hypothesis: PX PRAGUE is a martingale (Sign Variance Ratio Test)

Joint Tests	Value	df	Probability
Max |z| (at period 2)	11.43982	1241	0.0000
Wald (Chi-Square)	135.3006	15	0.0000
Individual Tests			
Period	Var. Ratio	Std. Error	z-Statistic	Probability
---	---	---	---	---
2	0.675262	0.028387	-11.43982	0.0000
3	0.554123	0.042316	-10.53676	0.0000
4	0.501209	0.053107	-9.392274	0.0000
5	0.463658	0.062192	-8.623961	0.0000
6	0.446414	0.070174	-7.888797	0.0000
7	0.434097	0.077369	-7.314342	0.0000
8	0.422240	0.083969	-6.880646	0.0000
9	0.411944	0.090098	-6.526828	0.0000
10	0.406446	0.095844	-6.192890	0.0000
11	0.404879	0.101270	-5.876567	0.0000
12	0.405855	0.106424	-5.582824	0.0000
13	0.403955	0.111342	-5.353304	0.0000
14	0.398296	0.116053	-5.184712	0.0000
15	0.392103	0.120583	-5.041317	0.0000
16	0.388598	0.124950	-4.893189	0.0000

Null Hypothesis: SBITOP is a random walk (Rank Score Variance Ratio)

Joint Tests	Value	df	Probability
Max |z| (at period 2)	17.71766	1241	0.0000
Wald (Chi-Square)	343.0607	15	0.0000
Individual Tests			

Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	0.497055	0.028387	-17.71766	0.0000
3	0.368036	0.042316	-14.93429	0.0000
4	0.282955	0.053107	-13.50200	0.0000
5	0.238358	0.062192	-12.24662	0.0000
6	0.219849	0.070174	-11.11743	0.0000
7	0.197786	0.077369	-10.36868	0.0000
8	0.180607	0.083969	-9.758302	0.0000
9	0.168574	0.090098	-9.227982	0.0000
10	0.156820	0.095844	-8.797393	0.0000
11	0.152481	0.101270	-8.368885	0.0000
12	0.142515	0.106424	-8.057277	0.0000
13	0.144032	0.111342	-7.687765	0.0000
14	0.134564	0.116053	-7.457217	0.0000
15	0.134348	0.120583	-7.178890	0.0000
16	0.135833	0.124950	-6.916123	0.0000

Null Hypothesis: SBITOP is a martingale (Sign Variance Ratio Test)

Joint Tests	Value	df	Probability
Max |z| (at period 2)	12.51851	1241	0.0000
Wald (Chi-Square)	174.5721	15	0.0000
Individual Tests			

Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	0.644641	0.028387	-12.51851	0.0000
3	0.549825	0.042316	-10.63832	0.0000
4	0.502015	0.053107	-9.377100	0.0000
5	0.466237	0.062192	-8.582500	0.0000
6	0.440505	0.070174	-7.973005	0.0000
7	0.428571	0.077369	-7.385760	0.0000
8	0.413376	0.083969	-6.986207	0.0000
9	0.403349	0.090098	-6.622226	0.0000
10	0.397099	0.095844	-6.290416	0.0000
11	0.399604	0.101270	-5.928648	0.0000
12	0.396186	0.106424	-5.673684	0.0000
13	0.400979	0.111342	-5.380026	0.0000
14	0.395994	0.116053	-5.204550	0.0000
15	0.397690	0.120583	-4.994985	0.0000
16	0.400282	0.124950	-4.799678	0.0000

Null Hypothesis: WIG is a random walk (Rank Score Variance Ratio)

Joint Tests	Value	df	Probability
Max |z| (at period 2)	17.03826	1241	0.0000
Wald (Chi-Square)	314.5094	15	0.0000

Individual Tests			
Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	0.516341	0.028387	-17.03826	0.0000
3	0.345801	0.042316	-15.45974	0.0000
4	0.263097	0.053107	-13.87592	0.0000
5	0.214357	0.062192	-12.63253	0.0000
6	0.202986	0.070174	-11.35774	0.0000
7	0.181900	0.077369	-10.57401	0.0000
8	0.174534	0.083969	-9.830623	0.0000
9	0.157243	0.090098	-9.353753	0.0000
10	0.147304	0.095844	-8.896673	0.0000
11	0.144879	0.101270	-8.443954	0.0000
12	0.134658	0.106424	-8.131105	0.0000
13	0.134942	0.111342	-7.769405	0.0000
14	0.130704	0.116053	-7.490483	0.0000
15	0.125781	0.120583	-7.249937	0.0000
16	0.125674	0.124950	-6.997426	0.0000

Null Hypothesis: WIG is a martingale (Sign Variance Ratio Test)

Joint Tests	Value	df	Probability
Max |z| (at period 2)	12.00755	1241	0.0000
Wald (Chi-Square)	154.5818	15	0.0000

Individual Tests			
Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	0.659146	0.028387	-12.00755	0.0000
3	0.547677	0.042316	-10.68910	0.0000
4	0.476229	0.053107	-9.862646	0.0000
5	0.435294	0.062192	-9.080036	0.0000
6	0.424926	0.070174	-8.195009	0.0000
7	0.412916	0.077369	-7.588110	0.0000
8	0.402498	0.083969	-7.115759	0.0000
9	0.386874	0.090098	-6.805073	0.0000
10	0.384206	0.095844	-6.424935	0.0000
11	0.381437	0.101270	-6.108041	0.0000
12	0.377921	0.106424	-5.845308	0.0000
13	0.377673	0.111342	-5.589348	0.0000
14	0.377115	0.116053	-5.367224	0.0000
15	0.378781	0.120583	-5.151802	0.0000
16	0.382353	0.124950	-4.943168	0.0000

Source: Own elaboration

5. CONCLUSION

The general conclusion to be retained and supported by the results obtained, through the tests performed with econometric and mathematical models, is that the global pandemic of 2020 and the Russian invasion of Ukraine in 2022 had a significant impact on the memory properties of the markets analyzed. We further verify that prices are not i.i.d. This has implications for investors, as some returns may be expected, creating opportunities for arbitrage and unusual profits. These findings also open room for market regulators to take steps to ensure better information in these regional markets.

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The Evolution of the Cryptocurrency Market
Is Trending toward Efficiency?

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Abstract: *When compared to traditional financial markets, cryptocurrencies were seen as assets with minimal correlations. However, because this continually expanding financial market is marked by substantial volatility and strong price movements over a short period, developing an accurate and reliable forecasting model is deemed crucial for portfolio management and optimization. Given the relevance of cryptocurrencies in the global economy, it is important to determine if Bitcoin (BTC) becomes more predictable as investors adopt more aggressive trading positions. We examine BTC over the period from May 15th, 2021, to April 14th, 2022 (8676-time data), using intraday (hourly) time scales. The results reveal that the random walk hypothesis is rejected at lags of 3 to 16 days, while we see that the BTC market tends toward efficiency (see the evolution between lags of 16 and 2). These findings reveal that, given the uncertainty in the global economy in 2022, namely the Russian invasion of Ukraine, the BTC market shows values of the variance ratios close to unity, implying that it is, apparently, not predictable and that the residuals are not autocorrelated in time. In addition, the results of the Detrended Fluctuation Analysis (DFA) exponent show that this market does not exhibit characteristics of (in) efficiency in its weak form. In other words, this market does not have persistent and mean-reverting properties, thus validating the results of Wright's Rankings and Signs variance test.*

1. INTRODUCTION

On February 24th, 2022, Russia launched a full-scale military invasion against Ukraine, one of its southwest neighbours, escalating a conflict that began in 2014. Several analysts called the invasion the largest military invasion in Europe since World War II (Bloomberg, 2022).

In recent years, we have observed a tendency in financial institutions to include digital assets in their portfolios, such as cryptocurrencies, in order to diversify their portfolios more efficiently. Although cryptocurrencies have some similarities with certain traditional assets, financial agents and investors have recognized that digital currencies have their own nature, and the market fluctuations are currently being studied for a deeper understanding (Fang et al., 2022).

Cryptocurrency is a new type of asset that emerged because of the evolution of financial technology and created a great opportunity for research work. Due to volatility and price dynamism, a cryptocurrency price forecast is challenging. However, hundreds of cryptocurrencies are in circulation throughout the world (Hamayel and Owda, 2021).

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In this way, this research will test the persistence and efficiency, in its weak form, of the BTC from May 15th, 2021, to April 14th, 2022 (8676-time data), using intraday (hourly) time scales. The findings indicate that the BTC market does not show evidence of (in) efficiency in its weak form. In other words, this market does not exhibit the properties of persistence and mean-reversion, thus validating the results of Wright's (2000) Rankings and Signals variance test. These findings indicate that it will be difficult for investors to achieve above-market average returns without incurring additional risk.

This study contributes to the current body of knowledge. The first contribution relates to the study of efficiency, in its weak form, of the BTC market, using intraday data. The second contribution, on the other hand, is related to the time-lapse, being marked by the global pandemic of 2020 and the Russian invasion of Ukraine in 2022. As far as we know, this is the first study that analyses this theme.

The article is structured into five sections. The introduction to the investigation issue and the research question may be found in Section 1. Section 2 is dedicated to a literature review of market efficiency. Section 3 presents the data as well as the methodology to answer the research question. In Section 4, we can see the study results, and in Section 5, we can see the key findings.

2. LITERATURE REVIEW

In recent years, institutional and individual investors have expressed an interest in the growth of digital currencies, with an emphasis on Bitcoin and Ripple. The trading of these cryptocurrencies has led to fluctuations in the formation of speculative prices, and the literature has shown that this trading strategy has caused "bubbles" in international financial markets, resulting in sharp structural breakdowns (e.g., the Dot.com crisis, the 2007-2008 crisis, the 2015-2016 stock market crash in China, among others). Because precious metals markets such as gold are less correlated with global stock indexes and cryptocurrencies have the same trading characteristics as stocks, precious metals can operate as safe-haven assets (Kakinaka and Umeno, 2021).

Kristoufek (2018) investigated the efficiency, in its weak form, of the digital currency BTC and compared it with the U.S. dollar and Chinese yuan. The author demonstrates that BTC was inefficient in the years from 2010 to 2017 and contends that this inefficiency was caused by digital market disinvestment. The authors, Dimitrova et al. (2019), investigate if BTC-USD had long memories between 2010 and 2019. The authors show that the exponents of the BTC-USD series are more than 0.5, but they also show that this result does not demonstrate long memories and that its likely reason is connected to a distribution with sharp tails.

In 2020, Chibane and Janson (2020) examined the presence of long memories in digital currencies, namely Bitcoin and Ethereum. In their research, they estimated the multifractal trend of time series and demonstrated that the inefficiency is related to digital market disinvestment. Krückeberg and Scholz (2020) examined time data from BTC, at the tick level, in the period from February 2013, to April, 2018, demonstrating that spreads increase during the first hours of the day (according to universal time) when new exchanges occur in the markets.

The authors show that during the 2017 year and the first quarter of 2018, they had $38 million in arbitrage net profit opportunities, implying and relying on long-term analysis and demonstrating the inefficiencies of the BTC market over time.

Shrestha (2021) measured BTC in order to determine if BTC has persistence in its returns. For this purpose, the author employed the econophysical model Multifractal Detrended Fluctuation Analysis (MF-DFA). According to the author, BTC has long memories and the formation of its market price may be predictable with a more aggressive trading strategy and with the required lags.

In more recent studies, Fang et al. (2022) used the generalized Hurst exponent, to analyse the efficiency of BTC with intraday (1 minute), daily, and weekly data. The authors show that efficiency is related to time scales; that is, in the long run, BTC is efficient regardless of frequency, whereas evaluating data for 1 minute and weekly BTC shows predictability.

Wu et al. (2022) compared BTC to the Ethereum, Binance Coin, S&P 500, and Spot Gold markets during the Covid-19 pandemic. According to the findings, BTC remains efficient after the beginning of the pandemic and is more efficient than Ethereum, Binance Coin, and S&P 500 during the pandemic.

This research work aims to make a significant contribution to the current literature by demonstrating whether BTC is efficient in periods of uncertainty, particularly during the global pandemic of 2020 and the Russian invasion of Ukraine in 2022.

3. METHODOLOGY

3.1. Data

Data regarding the closing prices of the BTC cryptocurrency was obtained from the Thomson Reuters Eikon platform. The price indexes are intraday, and comprise hourly time scales, over the period from May 15th, 2021, to April 14th, 2022 (8676-time data).

3.2. Methodology

We described and summarized collected research data using particular methodologies such as descriptive statistics (mean, standard deviation, skewness, and kurtosis). The understanding of the shape of data is a critical step to check the normality of the distribution of observations, required by many parametric tests. Thus, skewness and kurtosis are two key statistical techniques to study the normal distribution of the time series. The skewness essentially measures the symmetry of the distribution, and the kurtosis determines the heaviness of the distribution tails. To validate the results, we applied the Jarque and Bera (1980) goodness-of-fit test and, additionally, through graphic representations, we analysed the stability of the residuals.

To answer the research question and with the purpose of testing market efficiency, in its weak form, we employed a non-parametric test developed by Wright (2000), to conclude the random walk and martingale hypotheses. This approach includes two tests, namely the Rankings test for homoscedastic series and the Signs test for heteroscedastic series. To validate the results, we used the Detrended Fluctuation Analysis (DFA). DFA is an analysis method that examines temporal dependence on several time scales, thus avoiding spurious results. Its interpretation should be understood as follows: $\alpha_{DFA} < 0.5$ (long-range, anti-persistent); $\alpha_{DFA} \simeq 0.5$ (uncorrelated, white noise); $\alpha_{DFA} > 0.5$ (long-range persistent). For a better understanding of the econophysical model, see the articles by the authors Dias et al. (2021), Zebende et al. (2022), Dias et al. (2022), Guedes et al. (2022).

4. RESULTS

Figure 1 shows the evolution of BTC over the period from May 15th, 2021, to April 14th, 2022, with hourly time scales. Based on the graphical analysis we can see structure crashes in July 2021 and in January 2022, with the most significant crash in May 2022. These crashes are related to the instability experienced in international financial markets, due to the situation arising from the Russian invasion of Ukraine.
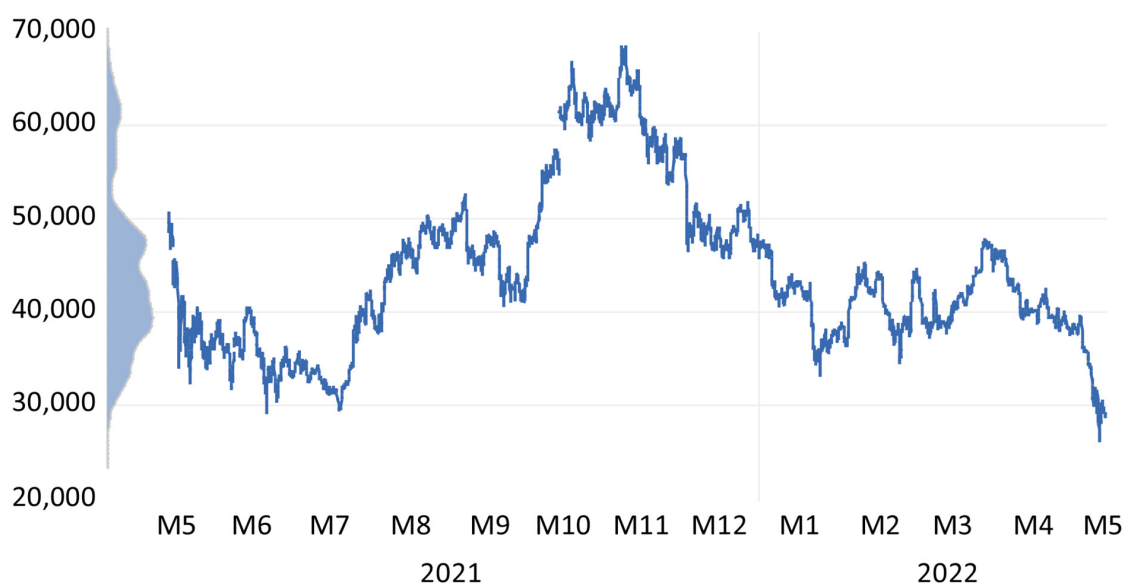
Note: Thomson Reuters Eikon: 8676 data, time scale in hours.
Figure 1. Evolution (in levels) of the BTC
for the period from May 15th, 2021, to April 14th, 2022
Source: Own elaboration

Figure 2 shows the main descriptive statistics regarding BTC, for the period May 15th, 2021, to April 14th, 2022, with intraday (hourly) data, and we can contract that the average market return is negative, the standard deviation presents a value of 0.008, and the asymmetry presents negative values (-0.26), and the kurtosis sharp values (21.89). Additionally, the asymmetry and kurtosis coefficients are statistically different from those of a normal distribution, being leptokurtic and asymmetric. The results suggest a deviation from normality and these findings are validated by the Jarque and Bera (1980), goodness-of-fit test (H_0 is rejected for a significance level of 1%).
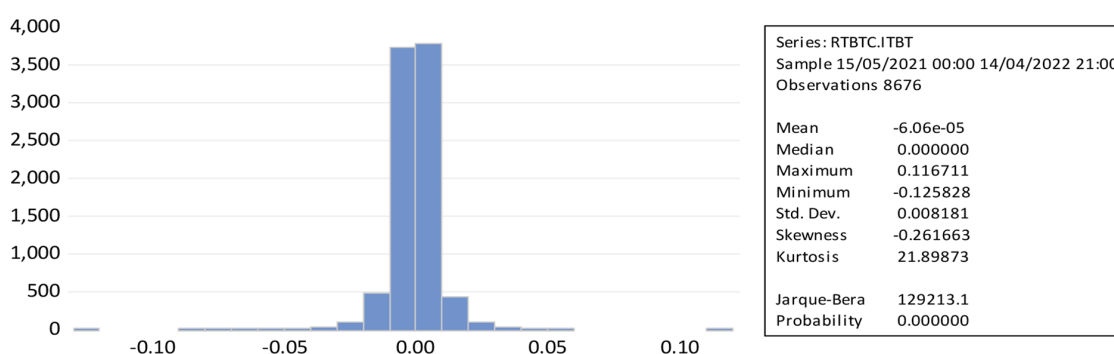
Figure 2. Descriptive statistics, return, of BTC
for the period from May 15th, 2021, to April 14th, 2022
Source: Own elaboration

Since we are estimating time series, we must examine the stationary nature of the BTC time series, with intraday (hourly) scales. The Dickey and Fuller (1981), Perron and Phillips (1988) tests postulate that the null hypothesis has unit roots, showing the stationarity of time series, in first differences. The Kwiatkowski et al. (1992) test, on the other hand, postulates stationarity in the null hypothesis and, as we can see, there is no rejection of H_0, but it should be noted that we had to transform the original time series (prices) into returns to achieve stationarity (see tables 1, 2 and 3).

Table 1. Dickey and Fuller (1981) stationarity test applied to BTC
for the period from May 15th, 2021, to April 14th, 2022

Null Hypothesis: D(BTC.ITBT) has a unit root		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-91.40209	0.0001
Test critical values:	1% level	-3.430928	
	5% level	-2.861680	

Note: *MacKinnon (1996) one-sided p-values.

Source: Own elaboration

Table 2. Perron and Phillips (1988) stationarity test applied to BTC
for the period from May 15th, 2021, to April 14th, 2022

Null Hypothesis: D(BTC.ITBT) has a unit root		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-91.38723	0.0001
Test critical values:	1% level	-3.430928	
	5% level	-2.861680	

Note: *MacKinnon (1996) one-sided p-values.

Source: Own elaboration

Table 3. Kwiatkowski et al. (1992) stationarity test applied to BTC
for the period from May 15th, 2021, to April 14th, 2022

Null Hypothesis: D(BTC.ITBT) is stationary		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.127761
Asymptotic critical values*:	1% level	0.739000
	5% level	0.463000

Note: *Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Source: Own elaboration

Figure 3 illustrates the stability test performed on the residuals of the BTC time series and we found a non-stable variance with the violation of the probability bounds at 95%, indicating significant volatility due to the global economy uncertainty.

The statistics of Wright's (2000) Rankings and Signals variance test can be observed in table 4. The statistics were calculated for lags of 2 to 16 days and considering the p-values, the random walk hypothesis is rejected at lags 3 to 16 days, but we found that the BTC market tends toward efficiency (see evolution from lag 16 to 2).

Given the uncertainty in the global economy in 2022 as a result of Russia invasion of Ukraine, these findings reveal that this market shows values of the variance ratios close to unity, which implies that this market is apparently not predictable and that the residuals are not autocorrelated in time.

The authors Dias et al. (2020), Dias et al. (2021), Zebende et al. (2022), Dias et al. (2022), do not validate the findings, because authors show evidence in their works that international financial markets may be predictable and that investors who use aggressive trading strategies with market-adjusted lags can eventually achieve above-average returns without incurring additional risk.
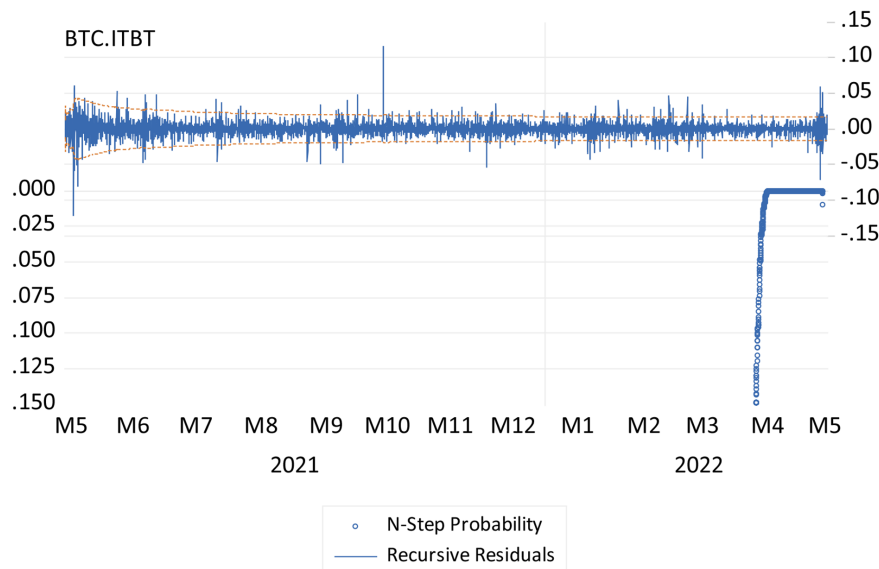
Figure 3. Stability test carried out on BTC waste
for the period from May 15th, 2021 to April 14th, 2022
Source: Own elaboration

Table 4. Tests of Wright's (2000) Variance Ratios of Rankings and Signals, in yields,
referring to BTC for the period May 15th, 2021 to April 14th, 2022.

Null Hypothesis: BTC. ITBT is a random walk (Rank Score Variance Ratio)

Joint Tests	Value	df	Probability
Max |z| (at period 6)	2.906991	8675	0.0130
Wald (Chi-Square)	20.15325	15	0.1860

Individual Tests				
Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	0.994963	0.010737	-0.469103	0.6190
3	0.969129	0.016005	-1.928793	0.0510
4	0.947845	0.020086	-2.596540	0.0060
5	0.932760	0.023523	-2.858518	0.0020
6	0.922844	0.026541	-2.906991	0.0020
7	0.918999	0.029263	-2.768034	0.0030
8	0.914941	0.031759	-2.678235	0.0050
9	0.911127	0.034078	-2.607963	0.0120
10	0.910388	0.036251	-2.472005	0.0110
11	0.908273	0.038303	-2.394761	0.0150
12	0.904925	0.040252	-2.361977	0.0180
13	0.900162	0.042112	-2.370748	0.0180
14	0.896416	0.043894	-2.359841	0.0200
15	0.893537	0.045608	-2.334319	0.0230
16	0.891887	0.047259	-2.287652	0.0250

Note: Test probabilities computed using permutation bootstrap: reps=1000
Source: Own elaboration

Table 5 shows the results of the Detrended Fluctuation Analysis (DFA) exponent for the BTC market, applied with intraday (hourly) scales, and we find that this market has no evidence of (in)efficiency, in its weak form, in other words, this market does not have the persistent and mean-reverting properties, thus validating the results of Wright's (2000) Rankings and Signals variance test.

Table 5. DFA exponent, in return, with adjustment $R^2 > 0.99$

Index	DFA exponent
BTC	$0.47 \cong 0.00068$

Note: The hypotheses are H_0: $\alpha = 0.5$ and H_1: $\alpha \neq 0.5$.

Source: Own elaboration

5. CONCLUSION

The purpose of this research was to see if BTC becomes more predictable as investors take more aggressive trading positions. We examined BTC over the period from May 15th, 2021, to April 14th, 2022 (8676-time data), using intraday (hourly) time scales. We performed two tests, one econometric and one econophysical, to examine the study subject. We investigated the efficiency of the BTC market in its weak form using Wright's Rankings and Signs variance test. We used the Detrended Fluctuation Analysis (DFA) approach to analyse time dependency in non-stationary data series.

The results show that the random walk hypothesis is rejected at lags of 3 to 16 days, but we see that the BTC market tends toward efficiency (see evolution between lags of 16 and 2). Given the uncertainty in the global economy in 2022, the results indicate that this market has variance ratios close to unity, implying that this market is apparently not predictable, and that the residuals are not autocorrelated in time. In addition, the findings of the Detrended Fluctuation Analysis (DFA) exponent show that this market does not exhibit characteristics of (in) efficiency, in its weak form. In other words, this market does not have persistent and mean-reverting properties, thus validating the results of Wright's Rankings and Signs variance test.

In conclusion, we can demonstrate that the worldwide pandemic of 2020 and the Russian invasion of Ukraine in 2022 caused structural breakdowns in the cryptocurrency market, but the answer is negative when we examine if these events induced memory in BTC quotation prices. The findings indicate that the BTC market has no memory during the time period under consideration, and the residues are independent and identically distributed, indicating that yesterday's price does not explain today's price.

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Information Efficiency
in Small and Underdeveloped Financial Market

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Abstract: *Testing the efficient market hypothesis can always bring interesting points regarding the functions of the financial markets. Every investor wants to beat the market, and therefore he is trying to find information that will gain him some privileges. On the other side, the stock exchanges and regulatory agencies are striving to eliminate those information privileges. This is where market efficiency, its theory, and its forms come into question. Until today one can find research on testing the efficiency of different developed markets. However, there are still a lot of gaps in research involving small and underdeveloped markets. This research may put the developing markets on the investment opportunities map of international investors. The purpose of this paper is to show how information efficiency relates to the Macedonian stock market by testing the weak form efficiency, using the augmented Dickey-Fuller (ADF) test to observe whether they contain a unit root or not. The results will be used to show the opportunities for adopting a profitable investment strategy using the technical analysis of the Macedonian stock exchange. Additionally, the results show that by using the mouthy price differences one cannot beat the market as the prices are moving with a random walk, which is not the case if investors are analyzing daily price differences.*

1. INTRODUCTION

Valuation and determinants of asset prices are important preconditions for the rational decision-making process. Knowing the intrinsic value of the asset investors own or are planning to buy is undoubtedly of great relevance for market developments. Although there is a consensus on the previous facts, there are doubts about the efficiency of the markets. In the modern market economy, the value of financial assets is expected to be explained with the Efficiency Markets Hypothesis (EMH). Finally, a key question is whether prices reflect the information for one financial instrument.

Even, EMH is popular, yet connected with numerous dilemmas, the empirical analysis fundamentally incorporates its hypothesis in financial markets research. In addition, modern science can not ask investors to share their wisdom. Contrary, financial analysis is based on empirical research of the past time series.

The main goal of the paper is to evaluate the Macedonian financial market's weak efficiency. Literature review reveals that there is numerous efficiency hypothesis researched in many countries, but that is not the case for the Macedonian capital market. Furthermore, North Macedonian financial market characteristics allow to only test for the weak form, and not the semi-strong, or even the strong form of efficiency.

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The paper empirically tests the hypothesis of the weak form of efficiency of the Macedonian financial market with several empirical tests on the stock prices constituting the MBI 10 index for the period of 05.01.2016 – 10.10.2019.

2. LITERATURE REVIEW

The Efficiency Markets Hypothesis (Fama, 1965), tested in many countries, shows low efficiency through numerous research. It is also well known that the Rational Expectations Theory and the development of EHM as a financial markets-specific theory are subject to the 2013 Nobel Prize for Fama and Shiller. According to Fama there are no fully efficient markets, as well as there is no fully competitive market. The overall conclusion of the weak-form empirical test is that market development is a significant determinant, as well as the specific research technique. Early research, suggests that the weak efficiency form comes from the low level of serial correlation and the level of transactional costs. Solnk (1974), analyzed 234 stocks in 8 major European capital markets and confirmed the market efficiency, which is still lower than the US market.

Hudson, Dempsey и Keasey (1996), analyzed the returns in the capital market in England for 58 years, concluding that rules of trading can explain the efficiency, but at the same time that it is not enough to make above-average returns. Another research on big and developed markets suggests that the random walk hypothesis is rejected, leading to predictability in the elements of the returns. The same research proves the mean reversion of the long-term returns. More specifically, autocorrections take negative prefixes for the first two years, reaching minimal values in the period of the third and fifth year, ending in zeros afterward. One possible explanation is connected with expected returns or overreaction of the investors, which leads to stock prices fluctuating around their fundamental value.

Various research on Hungarian, Russian, Greek, Portugees, Chezch, Polish and Turkish markets, (Abrosimova, Gishan, and Linowski 2002, Classens, Dasgupta, and Glen 1995, Gilmor and Memanus 2003), rejects the hypothesis on a random walk, referring to nonefficient markets. Worhington and Higgs (2003), analyze the EHM on 16 developed and 4 developing markets, confirming the weak efficiency in German, Irish, Portugees, Swedish, English, and Hungarian markets. Here, it should be emphasized that market liberalization and efficiency are in positive relation. Namely, based on calculations of the relation of variances and nonparametric tests, Kim and Singhal (2000) conclude that markets tend to be more efficient after liberalization.

EMH is still respected in the literature dealing with capital markets since high efficiency is primarily connected with cost efficiency (Blume, Durlauf, 2015). Additionally, the research should consider investors' emotions and different transaction costs as a reason for discrepancies in fundamental changes in value and current stock prices (Goedhart, Koller, Wessels, 2010).

Accepting the weak efficiency form is related to current and correct price adjustments after relevant information, such as mergers, acquisitions, stock splits, etc. The seasonal character of the stock prices is inconsistent with EMH. The existence of EMH anomalies recognized as the January effect, overreaction, mean reversal, small firm effects, etc, suggest a more comprehensive approach to stock price movement analysis. Today is widely accepted that market efficiency contradictions relate to investors' irrationality, leading to accepting behavioral finances, as a combination with the core EMH.

Although there are numerous constraints in measuring price efficiency, the need for price information level; the level of investor informativity, as a fundamental for investing in capital markets, still must be a priority in academic research efforts.

3.   DATA AND METHODOLOGY

The paper shows the results of the weak form Market Efficiency test based on a random walk model, defined as a process with a current value dependent on past values:

$$X_t = X_{t-1} + \varepsilon_t, \text{ or, } X_t - X_{t-1} = \rho + \varepsilon_t \tag{1}$$

Only when $\rho = 1$, we can conclude for unstationary process, thus random walk.

$$\Delta (X_t - X_{t-1}) = \rho - 1 + \varepsilon_t \tag{2}$$

The coefficient $(\rho - 1)$ is measured with the least squares method. Measuring the coefficient helps to accept the hypothesis for a random walk when $\rho = 1$, and refusing when $\rho < 1$.

Random walk is described as:

$$P_t = P_{t-1} = \varepsilon_t, \text{ where } \varepsilon_t \in IID, N(0, \sigma^2) \tag{3}$$

Where, P_{t-1} is the stock prices in $t-1$, ε_t error term with $(0, \delta^2)$, and is a stochastic process.

Additionally, the paper consists of a unit root test, augmented Dickey-Fuller test, autocorrelation, and run test. The data used to test the hypothesis is defined with daily, weekly and monthly values of the MBI 10 index for the period of 05.01.2016 – 10.10.2019. Data series usually are nonstationary as a trend and seasonal oscillations. Thus, it was crucial to run the necessary data consistency tests. Descriptive statistics show, that for the analyzed period the value of the MBI 10 index has a rising trend, with several episodes of decline. The overall rise is more than 100%, and the analyzed period is connected with political shifts, mainly toward improving the political prospects of the Macedonian economy.

Figure 1. MBI 10 movement
Source: Macedonian stock exchange

Testing the efficiency in transitional capital markets, such as Macedonian, should involve the liquidity, institutional and regulatory context, size, and information characteristics. In other words, refusing the efficiency hypothesis does not necessarily mean that investors are gaining over-average returns, meaning that inefficiency may come because of low liquidity and the ability to realize the transaction with current market prices.

Proving the random walk hypothesis means that Macedonian investors can not beat the market, or that the Macedonian stock market is efficient. Opposite, if the test determines serial correlation in daily, weekly, or monthly stock returns, proving that the series is stationary, with no unit root, the analysis can reject the null hypothesis – prices are moving with a random walk.

Hypothesis testing is based on random walk models, specifically: movement test, run тest, autocorrelation test, and unit root test (ADF, KPSS). For every test, the hypothesis is given in Table 1.

Table 1. Methods used to test the hypothesis

Run тest	Autocorrelatoion test	Unit root testADF	Unit root test KPSS
X_0: *Returns are independent*	X_0: *returns are not in correlation*	X_0: *Series has a unit root*	X_0: *Series is stationary*
X_a: *Returns are dependent*	X_a: *returns are in correlation*	X_a: *Series does not have a unit root*	X_a: *Series is not stationary*

Source: Author's research

Accepting the hypothesis that the returns are independent, not in correlation, do not have unit root and the series is stationary leads to accepting the null Hipotesis - prices are moving with a random walk.

4. RESULTS

A weak form of efficiency is tested with the logarithm of the daily, weekly, and monthly index of the returns:

$$R_t = \log\left(\frac{P_{It}}{P_{It-1}}\right) \qquad (4)$$

Estimating with computer software, the results of the different tests are given in Table 2.

Estimated results suggest that the hypothesis X_0 for all three models is rejected. As we can see all three series have a p-value below 0,05. That leads to the conclusion that daily, weekly, and monthly returns are not random and that in the analyzed period the results find an inefficiency market for MBI 10 index. As well as the Run test, with the correlation test, the results detect a statistically significant (+) coefficient of correlation in lag 1. Thus, again we are refusing X_0 and accepting X_a for all three series, concluding that the Macedonian stock market is not moving with a random walk. Another characteristic of weekly data is that they have the highest positive coefficient of correlation, meaning that when investors use technical analyses can beat the market.

Unit root test where the p-value is below the critical value for all three series whilst again refusing the null hypothesis. Accepting the alternative hypothesis means that the prices at the Macedonian stock market, more specifically the stocks consisting of the MBI 10 do not move with the random walk. Only with the KPSS test for daily and weekly returns, we can find a random walk, but in this stage, we must treat such a case as an exclusion, rather than a rule (Table 3).

Table 2. Results of the different tests

Run test	R_{td}	R_{tw}	R_{tm}
Number above cutoff	1533	1499	83
Number below cutoff	1462	1479	65
Number of runs	1099	491	59
E (R)	1448,355	1447,815	71,071
Stdev (R)	26,895	26,885	5,880
Z-value	-12,989	-35,589	-2,053
p-value (2-tailed)	0,000	0,000	0,040

Lag	R_{td}	R_{tw}	R_{tm}
1,00	0,3987	0,8811	0,1440
2,00	0,0480	0,6793	0,0676
3,00	-0,0077	0,4695	-0,0749
4,00	0,0111	0,2704	0,1109
5,00	0,0092	0,1203	0,0147
6,00	0,0600	0,0900	0,0597
7,00	0,0332	0,0987	-0,1054
8,00	0,0270	0,1162	0,0064
9,00	0,0464	0,1360	0,0247
10,00	0,0385	0,1497	-0,0748
…	…	…	…
139,00	0,0353	-0,0327	0,0002

Source: Author's research

Table 3. Results of the different tests

KPSS тest	R_{td}	R_{tw}	R_{tm}
Eta (Observed value)	0,177	0,116	0,169
Eta (Critical value)	0,475	0,438	0,475
p-value (one-tailed)	0,331	0,563	0,351
Alpha	0,05	0,05	0,05

ADF тest	R_{td}	R_{tw}	R_{tm}
k	14	14	5
Tau (Observed value)	-10,954	-9,516	-4,154
Tau (Critical value)	-3,384	-3,384	-3,421
p-value (one-tailed)	< 0,0001	< 0,0001	0,007
alpha	0,05	0,05	0,05

Source: Author's research

5. CONCLUSION

Determining the price value is crucial for every investor. They invest a lot to find undervalued stocks. Even though country regulators, stock exchange, and company corporate culture make a great effort to publish every important and relevant information, academic research seeks certain results in market efficiency. The most relevant question is whether the level of efficiency is weak, semi-strong, or strong. The Efficient Market Hypothesis is widely tested, and still, dubious results can be found in different countries and periods. Even though the analysis of EMH is from decades ago, the analysis of the Macedonian stock market is at its very beginning.

The empirical research on hypothesis testing, with several techniques, suggests that all three series (daily, weekly, and monthly) return of the MBI 10 index refuse the null hypothesis for the random walk. Thus, the paper concludes that the Macedonian stock market is inefficient in its weak form.

This conclusion can be supported by the latest developments in the Macedonian stock market. The extremely high global political risks, global economic threats, and changes in the key stock price determinants, such as interest rates, has a low effect on current stock prices. Additionally, even though some professional investors' analysis suggests that some stocks are at a "sell" position, their prices still have days of increase or moderate levels of decrease.

Literature suggests that the inefficiency and the level of stock market development are a direct link. Together with the development of the stock market, political and economic stability and economic development are key determinants for price efficiency. Additionally, in discussing future measures, institutional reforms are the key aspects. The specter of measures relates to every policy maker in the country (government, central bank, securities market regulatory agencies, stock exchange, academia) in coordinating activities towards better regulation, higher financial literacy, liberalization, etc. In that context, every measure should ultimately rise the information efficiency for both, investors' and companies' benefits.

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Corporate Social Responsibility in the Albanian Banking System

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Abstract: *Corporate social responsibility is a new concept in Eastern Europe and particularly in Albania. Albania came out of the communist regime without any kind of heritage or experience in the field of conception and later in that of applying social policies. But after the '90-s, the opening of Albania to free trade brought dramatic changes. These changes had their essential influences and on the field of social policies.*

The paper will make a presentation of the actual level of corporate social responsibility undertaken by each bank operating in Albania. The authors have built some graphs according to the number of initiatives in achieving each of the targets for each Albanian bank by analyzing and addressing the following in more detail each bank. The paper will be closed with some conclusions and recommendations.

1. INTRODUCTION

A socially responsible framework requires that actors involved in socio-economic or major economic projects (i.e., governments, investors, and communities) share specific and shared responsibilities for the functioning of the system. A socially responsible system is not based on a framework where no one wins. A socially responsible system creates opportunities through the synergies it creates or that helps to identify. The goal is sustainability or consistent results and benefits for all. A socially responsible system is one where a host of interactions take place between different categories of actors (governments, investors, and communities) thus creating, among other things, an effective partnership. Banks are also very important actors in this field. Effective partnerships between banks and various non-profit organizations or institutions of a social nature are a prerequisite for having sustainable and long-lasting results in their business.

The topics of Corporate Social Responsibility (CSR) have been thoroughly studied by theoretical and empirical research since the 1950s, and CSR is growing more significant in the age of globalization. As a result, realizing the value of CSR, the majority of banks have undertaken social and environmental initiatives that benefit both them and society (Yen Thi Hoang, Tran, 2014). Global need for banks to practice corporate social responsibility (CSR) has emerged. Banks from all over the world now support programs for educational, cultural, environmental, and health efforts by recognizing CSR. Additionally, they take sponsorship initiatives for humanitarian nonprofits and needy communities (Persefoni Polychronidou et al., 2013).

The state of CSR in banks has actually been the subject of numerous studies. In contrast to individuals who work in the 21ˢᵗ century, management without consideration for the needs and desires of partners in a group won't be focused on. There is a greater demand for accountability

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and frankness from both the public and private sectors. In earlier times, management sought both profitability and survival. These days, management is concerned with controlling both financial and non-financial outcomes while maintaining transparency. In light of this, corporate budgeting execution and corporate social responsibility (CSR) have become increasingly important (Khaled Hossain, Rahat Khan, 2016). The purpose of this paper is to analyze the involvement in social responsibility of banks in the Albanian banking system, in order to show that banks are not just business units, but they are also members of society, living, feeling and contributing to the progress of society. More and more companies are trying to work in a way both to protect the interests of employees, consumers, suppliers and other parties, as well as society as a whole. Therefore, it will be analyzed how the social responsibility of Albanian banks affects the community where they operate and the comparisons between banks.

2. CORPORATE SOCIAL RESPONSIBILITY

2.1. What is Corporate Social Responsibility?

Corporate Social Responsibility (CSR) has seen a significant rise in awareness and control in recent years on a global scale. CSR was an attempt to connect business with society when it was first formed in 1960. According to Lee (1997), CSR refers to a company's commitment to operating in a way that is both economically and environmentally sustainable, while also taking into account the interests of various stakeholders and maximizing economic, social, and environmental value. CSR, according to Holmes and Watts (1999), is a company's ongoing commitment to act morally, promote economic growth, and enhance the lives of its employees, their families, the local community, and society as a whole. As a result of the enterprises' embeddedness in various national business systems, Matten & Crane (2005) highlighted the fact that the firms will suffer varying degrees of internal, external, and lateral pressures to engage in CSR.

Corporate social responsibility (CSR) refers to tactics used by businesses or organizations to conduct their operations in a morally upstanding, sociably responsible, and developmentally advantageous manner. By assuming responsibility for the effects of their actions on stakeholders, employees, shareholders, consumers, suppliers, and civil society, corporate organizations can demonstrate interest in societal and environmental welfare in addition to their focus on profitability and growth (Dhingra and Mittal, 2014). Businesses have a social duty to operate in a way that serves society as well as its shareholders, in addition to generating shareholder profit. For investors and consumers looking for investments that are not only profitable but also contribute to the well-being of society and the environment, social responsibility has become increasingly crucial. Socially conscious businesses must implement policies that lessen their negative effects while promoting society's and the environment's well-being. Companies can behave responsibly in a variety of ways, including by encouraging volunteerism, enacting environmental improvements, and participating in philanthropic giving.

According to Trotta et al. (2012), CSR is a key factor in any institution's reputation and builds up economic value over time. According to Holder-Webb et al. (2009), CSR can be used as a source to gain a competitive advantage, boost the company's trust with stakeholders, and establish a long-term reputation. Social responsibility plays a significant role in enhancing the organization's overall reputation. Giving back to the community, interested parties, and clients would not only elevate the company but also guarantee expansion and long-term success.

2.2   When do banks take social responsibility?

Masud and Hossain (2012) studied ten commercial banks and discovered that 100 institutions disclosed their CSR initiatives, while 60% of the banks showed interest in endorsing the CSR zone as required by the budgetary legislation. Another study by (Habib et al. 2007) shows that CSR is largely regarded as a strategically significant problem for the long-term expansion and competitiveness of companies today. Bank CSR initiatives not only raise their own standards but also have an impact on other companies' socially conscious actions. According to (Lentner, Szegedi and Tatay,2015) The banking industry didn't react quickly enough to CSR concerns. It took into account social and environmental issues in that order (Vigano Nicolai, 2009). CSR appears to be the embodiment of the core concepts of business ethics and is used by the corporate sector as a tool to improve and legitimate the sector's economic performance (Scholtens, 2006). The 2008 financial crisis highlighted the need for CSR in this industry as well, driving home the importance of trust as well as the accountability and openness that lead to it. The need for ethical and responsible behavior has caused financial and investment processes to point beyond the protection of the legitimate interests of depositors and owners, which is traditionally thought of as the main social function of financial institutions. These processes include efficient allocation and risk management (Tzu-Kuan Chiu, 2013). The banking industry's CSR practices are distinct from those of other economic sectors due to this distinction. Here, there is a stronger focus on accountability in the sectors of bank lending, investment, and asset management operations, where bribery and money laundering prevention are crucial CSR initiatives for banks and where these concerns are of special importance (Vigano Nicolai, 2009). A bank that undertakes social responsibility is aware of the impact of its activities on society and acts accordingly. By providing sustainable products like green loans, ethical funds, and sustainable savings products, banking activities indirectly promote a sustainable society. Being a significant employer, the financial sector is also responsible for providing fair and equitable compensation, as well as long-term work that is both appealing and challenging. Due to staff mobility and the energy and paper usage in many branches, banks now directly affect the environment. Bank executives need to focus first on ensuring sound governance and fair business practices. Then they should look towards practicing social responsibility.

3.   CRS IN THE BANKING SYSTEM

3.1.   Some indicators of the Albanian Banking System

The banking system, in economies organized and operating according to free market principles, is divided into two levels. The division of the banking system into levels is done to identify the different functions performed by commercial banks and the central bank. At the first level is the central bank. The central bank is a constitutional institution which, in a broad sense, exercises "governing" functions. The Bank of Albania is the central bank of the Republic of Albania. Commercial banks stand at the second level. These banks are pure financial intermediaries, set up in the form of joint stock companies and aiming to provide profit for their owners. The Bank of Albania's intervention in the economy is always done in order to meet the objective of maintaining price stability. Monetary policy has interest rates as its main instrument. The central bank moves interest rate levels to bring inflation within its target. The Albanian banking system is the most important sector of the financial system in Albania, occupying about 85% of the financial system and implying the weak role of the capital market. This system has undergone a comprehensive transformation in the period from 1991 to 2021. In 1992 in Albania operated only three state-owned banks, while in 2021 the Albanian banking system operate 12 banks with private capital. The sources of financing of the Albanian banking system come mainly

from deposit activity (82.3% of the total liabilities of the banking sector). In terms of total deposits, only 12% belong to different businesses, while household deposits have the overwhelming weight of the system at 88%. The net financial result of the banking system has a positive performance. This has come because of the improvement in the price of securities that banks have in their portfolios, as well as a less significant positive impact that has had the extraordinary income mainly from the execution of collaterals left with banks to guarantee loans taken.

According to European Banking Federation (EBF), by the end of December 2020, the Albanian economy had expanded by 3%. The preceding year's economic shocks, first brought on by the fallout from the November 2019 earthquake, then by the epidemic, were actively resisted by fiscal policy. Extension of tax duties, issuing of sovereign guarantees to safeguard employees' pay and lessen credit risk for borrowers, and an increase in public spending on earthquake-damaged building reconstruction and public health requirements, were among the actions implemented. As a result, similar to other nations' experiences, the fiscal deficit and public debt saw a sharp growth in 2020. By the end of 2020, it was predicted that the public debt would be climbed to roughly 80% of GDP and the budget deficit to about 7% of GDP (or about ALL 110 billion). Both foreign and domestic borrowing accounted for the majority of the budget deficit's funding.

3.2. Corporate Social responsibility undertaken by banks operating in Albania

The banking system in Albania in the context of social responsibility aims to achieve the following objectives:
1) Poverty Free: Eliminate all forms of poverty worldwide;
2) Ensure food security, enhance nutrition, and advance sustainable agriculture to end hunger;
3) Good health and wellbeing: promoting and ensuring healthy lives for people of all ages;
4) Ensure accessible and equitable quality education while fostering chances for everyone to continue learning throughout their lives;
5) To achieve gender equality and to give all women and girls more power;
6) Affordable Energy: Provide affordable, secure, connection to modern, sustainable energy for all;
7) Promoting full, productive employment, decent work for everyone, and economic growth that is inclusive, inclusive, and sustainable;
8) Building resilient infrastructure, encouraging inclusive and sustainable industrialization, and embracing innovation are three interrelated concepts;
9) Lowering disparities: lowering disparities both inside and across nations;
10) Making cities and human settlements inclusive, safe, resilient, and sustainable is essential for sustainable cities and communities;
11) Ensuring sustainable patterns of consumption and production is responsible consumption and production;
12) Climate Action: Take immediate steps to mitigate the effects of climate change;
13) Underwater life: Responsible stewardship of the world's oceans, seas, and marine resources for a sustainable future;
14) Living in the wilderness: Protecting, restoring, and promoting the sustainable use of terrestrial ecosystems, sustainable forest management, combating the return of desert areas and stopping and reversing the process of land degradation and stopping biodiversity loss;
15) Partnership for Objectives: Strengthening the ways of implementation and reviving the global;
16) Sports, art, and culture: Sponsorship of cultural activities.

	Alpha Bank Albania	Credins Bank	Intesa Sanpaolo Bank Albania	Tirana Bank	Raiffeisen	Procredit Bank	American Bank of Investments	Banka Kombëtare Tregtare	FI Bank Albania	Union Bank	Banka OTP Albania
■ Poverty free	1	4	3	1	0	0	0	0	0	0	0
■ Zero hunger	1	0	1	0	1	1	0	0	0	0	0
■ Good health and well-being	1	9	3	1	6	2	8	2	5	1	0
■ Quality education	2	5	7	0	9	2	5	4	0	0	4
■ Gender equality	1	0	5	0	0	0	2	0	0	0	0
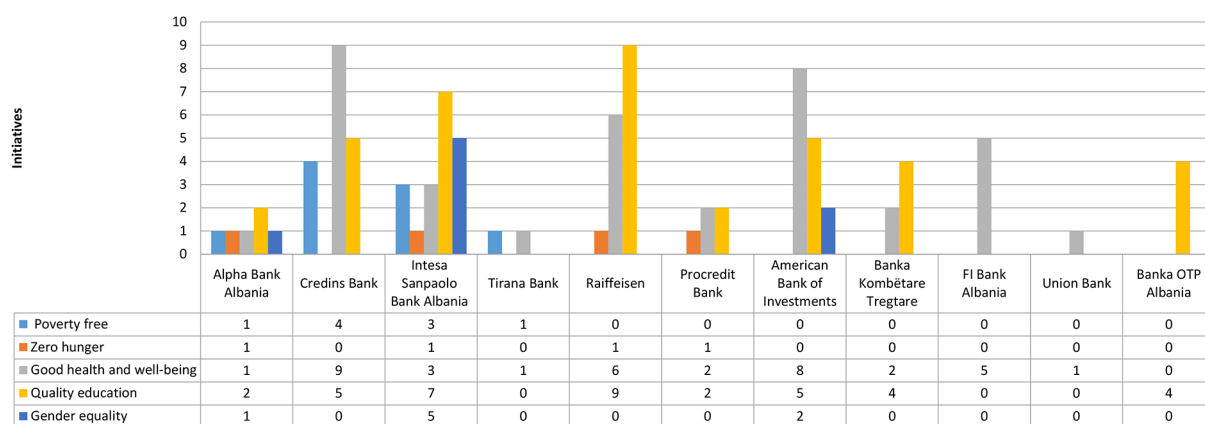
Figure 1. Number of initiatives for the first 5 CRS objectives

Source: Albanian Association of Banks (2020), refined by the authors

	Alpha Bank Albania	Credins Bank	Intesa Sanpaolo Bank Albania	Tirana Bank	Raiffeisen	Procredit Bank	American Bank of Investments	Banka Kombëtare Tregtare	FIBank Albania	Union Bank	Banka OTP Albania	UBA
■ Affordable energy	0	0	0	0	0	1	0	0	0	2	0	0
■ Dignified work and economic growth	2	6	9	0	1	1	0	2	2	2	0	0
■ Industry, inovation, and infrastructure	2	12	3	0	4	1	2	0	0	1	0	0
■ Reduction of inequalities	2	0	2	1	1	0	0	0	0	1	0	3
■ Sustainable cities and economies	1	0	2	2	18	0	9	5	1	0	1	0

Figure 2. Number of initiatives for the second 5 CRS objectives

Source: Albanian Association of Banks (2020), refined by the authors

	Alpha Bank Albania	Credins Bank	Intesa Sanpaolo Bank Albania	Tirana Bank	Raiffeisen	Procredit Bank	Banka Amerikane e Investimeve	Banka Kombëtare Tregtare	FIBank Albania	Union Bank	Banka OTP Albania	UBA
■ Responsible consumption and production	1	0	5	0	0	0	0	0	0	0	0	0
■ Action on climate	0	0	5	0	4	1	0	0	0	0	0	0
■ Underwater life	0	0	0	0	0	0	0	0	0	0	0	0
■ Wildlife	0	0	0	0	0	0	0	0	0	0	0	0
■ Partnership for objectives	4	2	4	3	1	1	2	0	0	0	1	0
■ Art, Sport & Culture	0	20	1	2	20	0	23	0	0	2	1	0

Figure 3: Number of initiatives for the last 6 CRS objectives

Source: Albanian Association of Banks (2020), refined by the authors

The graphs show the number of initiatives undertaken by each bank operating in Albania regarding each objective of social responsibility mentioned above. From the data and comparison in the figures above, it is noted that:

Alpha Bank Albania has contributed and undertaken initiatives in the realization of 12 objectives and has contributed to relatively small amounts among its initiatives in social responsibility. There are no activities that can help with climate action, fisheries and other nature-related activities and protection.

Credins Bank does not contribute to a wide range of social responsibility initiatives. It has helped with 7 targets, but, its contribution to those targets is relatively average and in some high. It has provided the greatest contribution to supporting cultural and artistic activities by supporting and financing several activities, concerts and festivals with material purchases.

Intesa Sanpaolo Bank Albania is the bank with the largest contribution to social responsibility, contributing in relatively high amounts to the achievement of almost all objectives except contributions for fishing, protection of natural ecosystems and connection to modern affordable energy. Its main contribution is to dignified work and economic growth where it has supported and developed programs that focus on reducing the unemployment rate in the country and constantly providing employment opportunities for various positions in the banking sector.

Tirana Bank offers relatively low contributions in terms of social responsibility. It has the greatest contribution in the realization of the partnership for the objectives where it has donated some facilities to help the families affected by the earthquake in 2019. It has mainly supported activities related to disaster relief and cooperation with some foundations but does not carry out activities in nature protection, and ecosystems and does not even support employees as in the case of Intesa Sanpaolo bank. Also, with still small contributions in this field is the UBA that has not even published a program on the protection of social responsibility in the official program and its official website.

OTP Albania Bank has made the main contribution to quality education.

Union Bank has contributed and undertaken relatively few initiatives, mainly in support of cultural, artistic and sports activities, for dignified work and economic growth, affordable energy, and infrastructure.

Fi Bank has few initiatives within social responsibility where the contribution to good health and well-being can be singled out.

Raiffeisen is one of the banks that undertakes the most initiatives in the context of social responsibility in Albania. It has the greatest contribution to supporting cultural, artistic and sports activities. It is also among the only ones that have taken initiatives in climate action where for more than 10 years it has been continuously contributing to environmental issues and especially to the cleaning of coastal areas.

American Bank of Investments has relatively high contributions to social responsibility but not with a broad scope like Intesa or Raiffeisen. It has mainly invested in supporting social, cultural and artistic activities, but it also has focused on ensuring sustainable communities, good health, quality education (training, support of students, employees), etc.

National Commercial Bank contributes to relatively low average social responsibility. It has made the highest contribution to quality education and sustainable communities.

ProCredit Bank has a poor program and spends little in terms of social responsibility where the main contribution is to quality education and good health.

4.   CONCLUSION

Social responsibility is the responsibility of an organization to maximize its positive impact and minimize its negative impact on society. Social responsibility is negative when the company with its behavior decides for large instant profits without thinking about the consequences. Social responsibility is positive when a company is established in a society, not as a parasite, but as an integral part of it, creating a relationship of mutual trust. This firm will stay there for a long time and will not be identified only as a business but as a point of reference and trust in the field where it operates.

Albania until the '90s came without any legacy or experience in the field of conception and then in the application of social policies. Lack of knowledge in this area, lack of awareness of social responsibilities as well as lack of a legal framework to promote the engagement of the business community in the social, environmental and ethical initiatives, are noted.

The banking system in Albania and in all organized economies that operate according to the principles of the free market is divided into two levels: the central bank (the main bank in charge of ALL issuance and monetary policy) and second-rate trade banks.

From the study and analysis done and organized on social responsibilities in the banking system between the realization of some objectives listed during the handling of the issue, it is noticed that banks in Albania (most) do not undertake effective well-thought-out and programmed initiatives around social responsibility. The banks that take the most initiative and pay more attention to this aspect are: Intesa Sanpaolo Bank, Raiffeisen, and American Investment Bank. Credins is more 'focused' and carries out relatively numerous activities but not with a wide scope in achieving the objectives.

Almost all of them focus on human rather than environmental responsibility. This fact and its exceptions are expressed in the analysis and results drawn in the last issue for each of the banks. It turns out that they are more concerned with creating a name and gaining short-term fame (most of their activities are in sponsoring cultural, artistic and sports activities) than in creating an effective social responsibility.

5.   RECOMMENDATIONS

Creating and programming an effective well-thought-out and organized social responsibility with great attention and dedication to thinking about long-term achievements.

Greater focus on environmental responsibility that is almost unnoticed. This is probably a result of the lack of knowledge in this area, the lack of awareness of social responsibilities and the lack of legal framework to promote the engagement of the business community in social, environmental, and ethical initiatives. Regulatory facilities may be created by local authorities on companies based on the initiatives and contribution they make to social responsibility.

Most banks do not consider the development of this aspect, very important from the analysis made and the conclusions drawn. We would recommend a deeper study and programming with more detailed studies in social responsibility where it is most needed.

Since banks as enterprises are focused on increasing short-term and long-term wealth, it would be beneficial to create a magazine, website, application, or economic television media, where aspects and measures taken by each bank are presented in an organized and attractive way, making this aspect more transparent and understandable for future investors, interested in the field and not only, but also of the vast population that constitutes a future clientele. This has many advantages that flow in other directions as well, improving various issues.

Develop an activity that serves as a kind of training for each industry where successful companies with many years of experience are mentioned and the social responsibility they pursue is introduced. This would help not only in increasing the social responsibility of each company from diverse industries but also in understanding the regulations that promote this aspect and all the issues that prevent it.

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Improve Sustainability Reporting through Integrated Reporting: Evidence from Italy

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Abstract: *This study aims to analyze the connections between integrated reporting (IR) and sustainability reporting (SR), in order to verify whether the IR can contribute to improving the SR prepared according to the Global Reporting Initiative (GRI) standards. In particular, this study considers the topic from the point of view of the SR to understand the benefits that it could obtain from the information disclosed through the IR. To this end, the study analyzes the integrated reports relating to the 2021 financial year of two listed Italian companies operating in the financial sector. The research has highlighted that some areas of sustainability, especially relating to the economic and environmental dimensions, are actually enhanced by integrated reporting, while the information benefits regarding the social dimension are less evident. The study can help indicate the advantages and possible improvements of the connections between SR and IR.*

1. INTRODUCTION

This study aims to analyze the contribution that integrated reporting (IR) can offer to the improvement of sustainability reporting (SR). In fact, the two accounting tools, although structured on different conceptual bases, have many areas in common thanks to which they are potentially able to reinforce each other.

Since the 1970s (Larrinaga & Bebbington, 2020), sustainability reporting has assumed increasing importance as a tool through which companies disclose information relating to the economic, social and environmental impact of their business, in favor of shareholders and stakeholders (O'Dwyer *et al*., 2005). In the Italian context, sustainability reporting remained optional until 2016 and became mandatory starting from 2017, following the transposition of EU Directive 95/2014, which introduced the obligation of non-financial reporting for large public interest entities.

This study analyzes the sustainability reporting prepared according to the Global Reporting Initiative (GRI) Standards, which today represent one of the reporting tools most used by companies (Christofi *et al*., 2012; Nikolaeva & Bicho, 2011). Integrated reporting is aimed at illustrating how the business strategy and future prospects of the company can preserve, create or destroy value in the short, medium and long term (Busco *et al*., 2013).

The purpose of this research is to verify whether the IR, as future-oriented, is able to enhance the SR which – by definition – is aimed at highlighting the company's ability to act in the present without jeopardizing the future. In this sense, according to the effective and well-known definition of the World Commission on Environment and Development (1987) sustainable development is "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*" (p. 54).

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In order to analyze the relationships between IR and SR, the research examined the integrated financial statements of two Italian listed companies belonging to the financial sector. Through a content analysis of the 2021 integrated reports, the disclosure on the six capitals – financial, manufactured, intellectual, human, social and relationship, and natural – on which the IR is based was analyzed. At the same time, the non-financial data produced according to the GRI standards were examined and the points of contact between the two sets of information were highlighted.

In particular, the goal of the content analysis was to verify whether the information provided for the purposes of sustainability reporting had connections with that provided for the purposes of IR and it was not simply an addition without relationships.

The research has highlighted how, in theory, there are many commonalities between the two types of reporting, mainly linked to the presence of areas dealing with the same issues. However, in the context of the reports analyzed, the IR is not always closely linked to the SR. In particular, this research has identified a ranking according to which the areas of sustainability that are most integrated with the IR are, in order, the environmental, the economic and, finally, the social ones.

This study contributes to the literature dedicated to the analysis of the most suitable accounting tools to improve sustainability reporting, in a context, such as the current one, in which social and environmental issues are acquiring maximum centrality, also due to the legal pressure deriving from the mandatory of the non-financial disclosure.

In addition, the analysis of the two business cases helps to highlight both the strengths of the IR and the points still subject to improvement, and thus it is useful for the research aimed at enhancing sustainability reporting.

2. THE SUSTAINABILITY REPORTING ACCORDING TO GRI STANDARDS

The Global Reporting Initiative is an independent international organization, founded in Boston in 1997 to support companies and entities – both public and private – in the preparation of their sustainability reports.

The GRI standards are adopted voluntarily and are the result of an elaboration process that began in 2000 with the issue of the first version of the GRI guidelines G1, followed by the G2 guidelines of 2002, the guidelines G3 of 2006 and the guidelines G4 of 2013. In 2016, the transition from the GRI guidelines to the GRI standards took place.

The version applicable to the 2021 financial year consists of 33 topic-specific standards, divided into three main sections – economic, environmental and social.

The widespread use of GRI standards by companies is due to a number of reasons.

First of all, the GRI standards constitute a structured and complete reporting framework useful for guiding the process of disclosure of non-financial information (Hedberg & Von Malmborg, 2003). In this sense, the adoption of GRI standards can help improve the rigor, quality and usefulness of sustainability reporting.

Secondly, the GRI standards provide a sustainability reporting framework characterized by a multi-stakeholder perspective (Islam *et al.*, 2011) and try to satisfy the information needs not only of shareholders, but of a wide audience of subjects directly or indirectly involved in business dynamics.

With reference to the financial sector, it is important to remember that its credibility was severely threatened by the 2008 international financial crisis which in many respects can be attributed to the responsibility of the banks and the excessive risk they were willing to take in lending policies. Thus, the adoption of GRI standards has represented for this sector a useful tool for recovering market credibility, improving the image and building a new identity through legitimate behaviors (del Mar Alonso-Almeida *et al.*, 2014).

However, it is necessary to consider that the literature has also highlighted the limitations of GRI standards. A first limitation concerns the possibility that non-financial reports are incomplete or not sufficiently transparent, above all due to the flexibility of standardization (Knebel & Seele, 2015). A further limitation of the GRI framework concerns the absence of specific indicators and guides on well-being, despite the fact that it provides a large amount of information regarding indicators on social, human rights, labor practices and environment.

Furthermore, the GRI framework adopts a retrospective approach and uses a structure built according to the same logic of financial reporting (Fonseca *et al.*, 2014).

Finally, the GRI framework obscures the achievement of a unified vision by excluding the development of integrated indicators and places the three dimensions of sustainability –economic, environmental and social – on the same level of importance, without considering their relationships (Moneva *et al.*, 2006).

This study draws its inspiration from this last criticism and seeks to identify the relationships between the different financial and non-financial dimensions disclosed by companies, in order to highlight the interconnection that could strengthen them.

3.   THE INTEGRATED REPORTING ACCORDING TO THE INTERNATIONAL INTEGRATED REPORTING COUNCIL

The purpose of integrated reporting is to combine financial and non-financial information, in order to offer stakeholders as complete a picture of the company as possible, not only referring to the past but also oriented to the future.

The conceptual framework for the drafting of integrated reports was developed by the International Integrated Reporting Council (IIRC), formed in August 2010 in order to create a globally accepted model for communicating the processes of value creation over time.

Integrated reporting must be concise, clear, comprehensive and comparable and must be focused on the strategic objectives of the organization, its governance and its business model.

The conceptual core of integrated reporting is represented by the disclosure of the effects of the six capitals on the creation of value over time. These capitals are: financial capital, manufactured capital, intellectual capital, human capital, social and relationship capital, and natural capital.

Integrated reporting must be future-oriented and must reflect the interconnections between the environment, social, governance and financial factors, highlighting the link between sustainability and economic value. In this sense, integrated reporting can be seen as the latest evolution of reporting on environmental and social aspects related to the activity of an organization as it encourages integrated thinking as a new way of conceiving corporate success (De Villiers and Maroun, 2017). But at the same time, it can also be considered as an evolution of financial reporting, rather than a development of sustainability reporting (Mio, 2016).

If we consider the two perspectives above together, we can see integrated reporting as a form of reporting focused on the financial dimension of the company which also contains information on the sustainability dimension.

Before analyzing the relationships between IR and SR it is important to underline that the two models have different functions and contents. According to Adams (2015), sustainability reporting:
- is aimed at a wider audience of stakeholders than IR, which mainly involves providers of financial capital;
- focuses on the economic, environmental and social impacts of the organization's activity, while IR focuses on creating value through capital.

Given the above, this study is based on the idea that although the SR has aims and recipients in part different from the IR and it is not fungible with the latter, there are still possible connections between the two, thanks to which the information on the economic, environmental and social impact of businesses can be enhanced.

The following section explains these connections through the analysis of the 2021 integrated reports published by two listed Italian companies.

4. EMPIRICAL ANALYSIS

4.1. Methodology

To analyze the integrated reports, the study developed the analysis model (Table 1), in which the possible connections between SR according to GRI standards and integrated reporting according to IIRC are identified.

Table 1. GRI standards and Integrated Reporting frameworks

GRI standards	Integrated Reporting
Economic impact	Financial capital
	Manufactured capital
	Intellectual capital
	Human capital
Environmental impact	Natural capital
Social impact	Social and relationship capital

Source: Author's elaboration

In particular, the connections in Table 1 have been identified based on the following considerations.
- Economic impact. The economic impact identified by the GRI standards was linked to the four capitals – financial, manufactured, intellectual and human – of the IR since they,

taken together, define the system of corporate resources directly at the service of production and therefore directly influencing economic performance.

- Environmental impact. The environmental impact identified by the GRI standards has been linked to the natural capital of the IR, since the main areas of disclosure – air, water, materials and biodiversity – are almost the same in both frameworks.
- Social impact. The social impact identified by the GRI standards was linked to the social and relationship capital of the IR since the two frameworks present, as their main common aspect, relations with communities.

It is important to emphasize that the aforementioned connections represent the thematic areas common to the two frameworks, while the approach to reporting followed by each of them, as well as their objectives of disclosure, remain different.

However, this last consideration does not at all exclude that the information on sustainability may be improved once, inserted in the context of integrated reporting; it is used and interpreted also according to the ability of capital to create value. In other words, this study believes that, although different, the two approaches – GRI and IR - are not only not incompatible, but can also reinforce each other.

In particular, the merger between financial and non-financial information can represent an effective tool capable of enhancing the content of reporting and its value for stakeholders, in compliance with the specificities and objectives of each framework.

To verify whether the SR has improved in the context of the IR, the study carried out a content analysis of the integrated reports of two listed Italian companies.

In particular, for each area of the GRI standards, the study verified the presence or absence of information relating to the contribution given by the six company capitals.

To this end, the contents were analyzed on the basis of the three parameters summarized in Table 2.

Table 2. Analysis parameters of the integrated reports

Framework	Evaluation Parameter
IR framework	Presence of disclosure on corporate capitals
GRI framework	Presence of disclosure on sustainability areas (economic, environmental and social)
Merger between IR and GRI framework	Presence of disclosure on relationships between corporate capitals and economic, environmental and social areas

Source: Author's elaboration

Similar to previous studies (Morhardt *et al*., 2002) each parameter was assigned a score, according to the following scale: 0 if disclosure is absent; 1 if the disclosure is summary; 2 if the disclosure is broad and detailed.

Since this operation was carried out for each of the three areas – economic, environmental and social – the maximum score obtainable by each company is equal to 18 (two points for each parameter, for each area), for a total of 36 points (18 points for each company).

4.2. Empirical Findings

The results of the study are summarized in Table 3.

Table 3. Integrated reporting, GRI standards and their merger in two Italian listed companies

Evaluation parameter	Economic area	Environmental area	Social area	Total
Presence of disclosure on specific corporate capitals among the six capitals	4	4	4	12
Presence of disclosure on specific sustainability area (economic, environmental and social)	4	4	4	12
Presence of disclosure on relationships between corporate capital and specific sustainability area	1	2	0	3
Total	**9**	**10**	**8**	**27**

Source: Author's elaboration

The results of Table 3 allow us to make some relevant observations.

First of all, for each of the three sustainability areas, the disclosure is broad (maximum score) both with respect to the integrated reporting framework and with respect to the GRI framework. This result confirms that the overall information provided by the two companies is complete and detailed for both the financial and the non-financial dimensions, considered separately.

Secondly, from the point of view of the individual sustainability areas, the most satisfactory score is obtained from the environmental area while the lowest is for the social area.

As for the environment, this result is mainly due to the fact that the notion of natural capital on which the IR is based has many aspects in common with the environmental dimensions identified by the GRI standards. It follows that natural capital that is able to create value for the environment is at the same time able to produce relevant results also from the perspective of the GRI standards. From this point of view, it is possible to conclude that sustainability reporting can concretely benefit from integrated reporting, since the merger of the information allows to combine the financial and non-financial aspects of the same phenomenon, providing stakeholders with a more complete disclosure.

Otherwise, as regards the social and relationship capital on which the IR is based, the connections with the GRI framework are less evident and this may be due jointly to two factors.

First of all, it is necessary to consider the objective heterogeneity of the areas relevant to the IR and those significant for the SR. In fact, while in the first case the relations between the communities focus mainly on the stakeholders and on aspects concerning the company, such as the brand and the reputation, within the GRI framework the social dimension, although referring to the communities, is more concentrated on work, employment, human rights and non-discrimination.

Secondly, it is important to take into account the propensity or ability of those who draw up the IR to prepare a disclosure capable of combining these two different, but contiguous perspectives, for example by highlighting how social and relationship capital can also create value promoting the well-being of workers.

Finally, in relation to the economic area, the score is intermediate to that of the two previous areas as the study found that the main and almost the only link between capitals and sustainability is represented by the disclosure of the distribution of added value.

5. CONCLUSION

This study aimed to analyze the relationships between integrated reporting and sustainability reporting in order to identify the presence of improvement areas through which to enhance sustainability disclosure.

In this regard, the study highlighted on the one hand that the disclosure provided to stakeholders by the two companies examined is significantly broad and complete, since it combines a large number of financial and non-financial data.

However, as described above, there are areas of sustainability, and in particular the social one, for which IR provides little information on the relationship between labor policies and value creation.

In this regard, an enhancement of disclosure on the social area – which the study highlighted as weaker – could be implemented not only through the reporting of human capital in terms of skills, abilities, experience and motivations, but also through the presentation of the effects on the value creation generated by the policies on employment, health and safety, training and education relevant for GRI standards.

In general, if on the one hand, it is clear that the IR and the SR have different objectives and adopt different reporting approaches, on the other hand, they can reinforce each other, without losing their specificities.

In this sense, rather than a sum of information, the IR should create an information system based on a unitary and comprehensive vision of the economic, environmental and social factors that contribute to the creation, conservation or destruction of value over time.

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Achieving Disclosure Efficiency Regarding the Climate-Related Issues: A Unique Challenge to the Present-Day Corporate Reporting

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Abstract: *Over the recent decades, climate change has been intensifying. The problems caused by climate change are unique. The process creates an existential threat to humans and other living beings interrelated with another risk arising from the crisis caused by biodiversity deterioration and environmental degradation. The coexisting impacts of both factors on people, biodiversity, economic sectors, and entities pose unprecedented challenges to humankind.*

The present-day unfavorable impacts of climate change require adequate governmental, and managerial strategies, policies, and activities as well as administrative actions for achieving sustainable, fair, and resilient growth. Phenomena and processes indicating climate change are developing on a global scale. That gives rise to discussions and highlights and justifies the need for meaningful, transparent, and complete climate-related disclosures.

The necessity of trustworthy disclosures on climate-related matters and inherent risks and opportunities related to adaptation to climate change and its mitigation is a problem of crucial importance to the article. The relevance of climate-related disclosures as a significant part of present-day corporate reporting proves to be of great significance for achieving disclosure efficiency. The author aims to highlight, discuss and justify the necessity of applying a responsible approach to carry out an adequate disclosure policy and provide meaningful, consistent, and comparable disclosures on climate-related matters, risks and opportunities considered a significant part of present-day corporate reporting, and substantiate why probable benefits for a sustainable future can be expected, not only for the company.

The terminology of the research is in the field of financial and non-financial reporting and their regulatory frameworks that are still not fully aligned. Heuristic methods of knowledge – analysis and synthesis, induction and deduction, descriptive approach, and techniques such as observation, analogy, comparison, and others are applied, for achieving the author's objective.

1. INTRODUCTION

> "It is time to recognize that human capital and natural capital are every bit as important as financial capital." – The United Nations Secretary-General, Ban Ki-moon

Over the recent decades, enormous scientific and empirical research efforts dedicated to sustainability, sustainable development, and climate change have been made. Ecologists and environmentalists devoted to research in different scientific fields maintain the thesis that greenhouse gas emissions pose considerable risk to many economic sectors and the global economy. Boards of companies should examine and look at matters related to climate change since there

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is a not insignificant risk that the scientists are correct, otherwise, it would be irresponsible, *Investor* wrote. The results of comprehensive surveys confirm our hypothesis that the conceptual idea of sustainability is not an innovative one. It is even argued that the idea dates back to Roman times. "It was part of the traditions and cultural norms of indigenous societies all over the world since their origin" (Sakalasooriya, N., 2021, p. 1).

At the Conference on Human Environment in 1972, the United Nations introduced the concept of sustainability. The conceptualization of the problem and the explanation and justification of the essential core values of the sustainable development concept has been central to many research and conceptual frameworks developed by global organizations and initiatives. After decades of thorough and intensive scientific debates and research, it is not surprising that there are currently over one hundred definitions of sustainable development and even over three hundred definitions regarding sustainability. The interpretations in particular studies differ – the authors' views, reflections, and descriptions are not identical but wide-ranging.

The paradigm of sustainable development is considered the most progressive overarching philosophy of the United Nations. Generally, the meaning of the phrase refers to achieving economic and social development in ways that do not exhaust countries' natural resources. The World Commission on Environment and Development's definition of 1987 is worldwide spread – "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." It is true that among the most commonly accepted and endorsed definitions is the definition proposed by the Report of the Brundtland Commission. It is specified in the Brundtland Commission's Report that "Sustainable development is not a fixed state of harmony but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs." The environmental, economic, societal, and cultural dimensions of the humanistic ideas of sustainable development are not distinct or separate from one another but rather interwoven. In general, 'sustainability' is broadly regarded as a paradigm created for future-focused strategic thinking. Its overarching goal is for contemporary societies to develop toward enhancing the quality of life by striking a balance between factors and considerations of environmental, economic, societal, and cultural nature. A healthy environment and prosperous society, for instance, ensures that residents and people have access to resources, clean air, safe drinking water, and food. The question arises whether there is a difference between "sustainability" and "sustainable development". 'Sustainability' is commonly viewed as a goal of the long-term future. Sustainable agriculture and forestry, sustainable production and consumption, good governance, research, technology transfer, education, and training are some of the numerous procedures and pathways to attain the goal of a more sustainable world. The strategic goal of our not only century but also millennium is to globally achieve such a process of radical change, such a progressive movement worldwide to attain the well-being and existence of present and future generations, of humankind, and all living beings. For decades, scientists, environmentalists, and ecologists devoted to achieving the most humane and humanistic goals of our century have been sounding that the contemporary mode of production, which is being compelled by economic globalization and business combinations of business entities primarily aimed at monopolizing highly profitable economic activities, has a detrimental effect on the planet's ecosystems. Ecological constraints do exist, and if the model is not altered globally, there would be a significant increase in the probability (risk) of becoming such hazardous processes irreversible. "If governments fail to act or delay adopting the necessary policies, the likely consequences and costs of [caused by] this policy inaction

will be significant. Without further policies to combat climate change, the OECD projects that greenhouse gas emissions will grow by about 52% by 2050. This would raise the global temperature between 1.7° and 2.4 °C compared to pre-industrial levels – at least twice the temperature increase was seen between 1899 and 2005" (OECD, p. 1).

2. CLIMATE CHANGE AND THE PARADIGM OF SUSTAINABLE DEVELOPMENT

Back in November 2011, at the Durban Summit[2] in South Africa, a message was sent to people and governments across the world. Natural chains among living species are destructed because of climate change and the destruction of the planet's biological diversity. The chain of life and natural history alter by the extinction of animal or plant species that generates a threat to humankind's survival and an infringement on nature's right to exist freely.

In 2015, the United Nations provided a common plan for peace and prosperity for people and the environment by accepting the 2030 Agenda for Sustainable Development. The Sustainable Development Goals (SDGs) underlying most humanistic doctrines were adopted after decades of hard work on behalf of 193 countries and the United Nations as an urgent appeal for action by both developed and developing countries, governments, and governmental representatives. It is acknowledged in the SDGs' justification that to eradicate poverty and other forms of deprivation, the efforts must also be focused on strategies and policies targeted at combating climate change, protecting the planet's seas and forests, and enhancing health and education.

On December 12, 2015, the Paris Agreement, the legally binding international treaty on climate change, was signed up[3], charting a radically new course in the global efforts against climate change. The Paris Agreement adopted by 196 Parties at COP 21 in Paris entered into force on 4 November 2016. Its essential goal is to restrict the rising of global temperature to well below 2 degrees (2 °C) above pre-industrial levels, as well as pursue efforts to limit the increase to 1.5 degrees (1.5 °C), setting the innovative ambition to respond to climate change globally and to accelerate and intensify the actions and investments needed for a sustainable low carbon economy. It is of crucial importance to achieve Paris Agreement goals for the nature of the challenges posed by climate change to be thoroughly understood worldwide.

The UN Global Goals, the Paris Agreement, and the Special Report of the Intergovernmental Panel on Climate Change (IPCC) of October 2018 appeal for urgent actions to reduce greenhouse gas emissions and create a low-carbon and climate-resilient economy. The EU has accepted targets for 2030 regarding greenhouse gas emissions decreases, renewable energy, and energy efficiency, and has endorsed guidelines on greenhouse gas emissions from land use and targets for cars and vans. In 2018, the Commission published the strategic long-term vision for building up a prosperous, competitive, and climate-neutral economy by 2050.

In the IPCC's report of February 28, 2022, it was announced that despite efforts, climate change induced by human activities is harmfully disrupting nature, causing detriment to the lives of billions of people. The damaged populations and ecosystems are those that are least equipped

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[2]   A major development was achieved in 2011 at the United Nations Climate Change Conference in Durban, South Africa, for the implementation of the Convention and the Kyoto Protocol, the Bali Action Plan, and the Cancun Agreements.

[3]   UN Climate Change. Key aspects of the Paris Agreement, 2022. Available at https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement/key-aspects-of-the-paris-agreement, last accessed on June 15, 2022.

to adapt. Hoesung Lee (2022), IPCC Chair, emphasized that the report is a dire warning about the consequences of inaction and reveals "Climate change is a grave and mounting threat to our wellbeing and a healthy planet. Our actions today will shape how people adapt and nature responds to increasing climate risks" (2022). "The IPCC's Working Group I report showed – unequivocally – that human activities have warmed the climate at a rate not seen in at least the past 2000 years" – Hoesung Lee remarked presenting the Working Group II contribution to the Sixth Assessment Report. Within the next two decades, the world will have warmed by 1.5 degrees Celsius. Unless the world takes audacious action, the temperature will keep rising.

Nowadays, companies carry out various activities, not only of industrial nature, in different geographical regions; that way companies experience the influences of various climate and physical-geographical factors; for performing their activities, companies held, control, and manage resources (assets) of different types; therefore, different companies may experience aggressive or unfavorable impacts of different climate-related phenomena, processes, and factors in a different way. Many companies will incur increases in costs (expenses) or decreases in revenues and income, or both effects. For example, increasing the cost of water and energy will lead to an increase in electricity and energy costs, consumed in operational activities of some companies; assets, for example, stocks or other kinds of investments, loans, or infrastructure assets may be foiled in specific locations due to extraordinary circumstances or unforeseen phenomena. For some companies, climate-related issues are material even now, with impacts disrupting supply chains and changing consumer behavior. In other cases, issues related to climate are a matter of long-term decisions, targeted at strategic planning, while for other companies climate-related risks are highly probable and foreseeable. As the manifestation of such risks becomes clearer, more and more people are likely to adapt their behavior and investments, thus making the prevention against potential aggressive climate change influences a short-term mission, task, and high responsibility for many companies. Equally important is the problem of how companies' operational activities affected the environment and climate, and what damage, impacts, and consequences these activities cause or engender.

In June 2017, the Task Force on Climate-Related Financial Disclosures (TCFD)[4] released its final report and recommendations. The Task Force's objective was to develop and establish a supportive framework for businesses and companies to create considerably more meaningful and impactful disclosures on climate-related matters using contemporary financial reporting practices and procedures. The TCFD highlighted the significance, value, and probable positive effect of transparency in considering and evaluating risks, especially climate change-related risks that would better enable knowledgeable and effective decisions on the allocation of resources and capital respectively. The TCFD acknowledged that difficulties may occur in gathering and releasing data on concerns of hazards related to climate change and emphasized how incorporating the relevant issues into annual financial disclosures would enable practices and procedures to advance more rapidly. It can be expected that if practices and techniques were improved it would eventually promote a more accurate assessment of risks and allocation of capital in the global economy and lead to further improvement in the quality of financial disclosures related to climate change. The process of management of assets and the predominant part of investors regardless of their investing capacity are facing the prospect of significant losses presupposed because of anticipated climate change effects. Companies may incur losses – assets may

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[4]   To help investors, lenders, and insurance underwriters properly evaluate a particular set of risks, the Financial Stability Board (FSB) established the TCFD intended to provide recommendations on the kinds of information that businesses should disclose to support investors, lenders, and insurance underwriters regarding hazards associated with climate change.

be damaged by natural phenomena like storms, floods, droughts, etc. There is a probability for asset portfolios to be affected and impaired through weaker cost-effectiveness, weaker profitability and growth, and lower returns on assets. Climate change generates long-term and even short-term problems, highly unfavorable processes that may prove irreversible surrounded by significant uncertainty.

There exists the consideration that climate change does not only pose challenges, it also creates opportunities of not only financial character, and such considerations give rise to optimistic attitudes. For example, the International Energy Agency estimates that shortly investments of about $1 trillion per year will be necessary to achieve the intended transition to a lower-carbon economy that would be creating new investment opportunities (World Energy Outlook Special Briefing for COP21, 2015). The energy sector investments are anticipated to cost approximately $3.5 trillion annually, on average, for the foreseeable future to achieve the projected transition to a lower-carbon economy, creating new investment opportunities. Concurrently, the physical effects of climate change, climate policy, or new technology may all have a substantial impact on the risk-return profile of businesses that are exposed to issues related to the environment and climate-related risks. According to a study, between now and the end of the century, the estimated value of the whole world's stock of manageable assets that are in danger from climate change ranges from $4.2 trillion to $43 trillion. It is highlighted that weaker growth and lower asset returns across the board will have a significant impact on future assets. It proposes that considering the probable negative impact on a variety of asset classes, investors may not be able to avoid climate-related risks by leaving particular asset classes.

Executives of companies and investors alike must thoroughly think about their longer-term strategies and how best to allocate resources and capital. Companies that invest in industries and activities exposed to climate-related risks may prove to be less adaptable to the transition to a reduced-carbon economy, and the probability of incurring lower returns by investors exists. The likelihood that present valuations may not appropriately account for climate-related hazards and risks due to a lack of sufficient information has a compounding effect on longer-term returns. Companies that can provide long-term investors with sufficient information about how they are preparing for a lower-carbon economy may have a competitive advantage. By 2050, the United Kingdom's government hopes to have eliminated all greenhouse gas emissions. With investors starting to follow, other countries are realigning around such goals, as exposed, for instance, in the UN-convened Net-Zero Asset Owner Alliance. Both businesses and investors will set their sights on this target since it suggests a unique indication for the long future for 30 years. Considering the emerging tendency, more and more companies will provide information on what their business model would look like in the future and how it will get there.

Results of our comprehensive research on the subject indicate that over the last decade there have been noticed good trends and reporting practices in Bulgaria and abroad of progressively intensifying disclosure focusing on climate-related risk even by companies, for which such disclosure is not obligatory. Many companies disclose such information voluntarily. Nevertheless, it should be emphasized that further improvement is necessary regarding both the quantity and quality of the disclosed information to optimize the balance between them. As it is specified in the Communication from the Commission (EC) "Guidelines on non-financial reporting: Supplement on reporting climate-related information"[5], improving the disclosure of climate-re-

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[5]   Official Journal of the European Union C 209/1 of June 20 2019, "Communication from the Commission (EC) Guidelines on non-financial reporting: Supplement on reporting climate-related information (2019/C

lated information would bring benefits to the disclosing companies themselves. Probable benefits can be the following:

- improved awareness about climate-related risks and opportunities within the company focused on climate-change mitigation and adaptation;
- better strategic planning, better decision-making as well as risk management;
- more diverse base of investors and a potentially lower cost of capital due to inclusion in actively managed investment portfolios and sustainability-focused indices;
- improved credit ratings and creditworthiness assessment of bank lending practices;
- more productive dialogue with stakeholders, investors, shareholders, and others;
- improved corporate reputation and maintenance of social license to operate; and
- constructive public appraisal and benevolence.

Following the EU Directive 2014/95[6] certain large undertakings and groups are required to disclose information to the extent necessary to understand the development, performance, state of affairs, and impact of the companies' activities, relating to environmental, social, and employment matters, to human rights, anti-bribery and anti-corruption issues. Logically, climate-related information can be considered to refer to the category of environmental issues. It is set out in the Commission's Non-Mandatory Guidance on the Disclosure of Non-Financial Information of 2017 that the wording on the "impact of [the entity's] activities" introduces a new element, which should be taken into consideration when the materiality of non-financial information is assessed. In practice, the perspective on materiality in the EU Directive on non-financial reporting and disclosure is double-sided. The reference to phrase "development, performance [and] condition" of the company refers to financial materiality perceived in a broad sense as an influence (impact) on the company's worth (value). If necessary to comprehend the company's development, performance, and condition, climate-related information should be presented, and investors are typically most interested in this viewpoint. The reference to 'the impact of [the undertaking's] activities' points toward materiality regarding environmental and social matters. Information related to climate should be disclosed if it is necessary to understand the external impacts of the company's activities. Typically, the most interested in this perspective are citizens, consumers, employees, business partners, communities, and organizations of civil society. However, increasingly investors also will need to be informed of the climatic impacts of the companies, in which they have invested, to better understand and measure the climate impacts of their investment portfolios. The perspective concerning "the materiality" of the EU Non-Financial Reporting Directive touches upon it from a financial viewpoint and an environmental and social one as well, whereas the Task Force on Climate-related Financial Disclosures (TCFD) perspective covers materiality from a financial viewpoint only. When an undertaking is mandated to prepare a non-financial statement, that statement must include information on the existing and anticipated impacts (effects) of that undertaking's operations and activities on the environment, as well as, where appropriate, on health and safety, the use of renewable and/or non-renewable energy, greenhouse gas emissions, water use, and air pollution[7].

209/01)", p. 1–30

[6] Directive 2014/95/EU of the European Parliament and of the Council of the EU of 22 October 2014 amending Directive 2013/34/EU, OJ L 330, 15.11.2014, pp. 1–9

[7] Ibid.

3. EU DOUBLE MATERIALITY PERSPECTIVE[8] AND EU NON-FINANCIAL REPORTING DIRECTIVE[9]

Companies should consider a longer-term period than the one taken into consideration for financial statements traditionally when assessing the materiality of climate-related information. Companies are cautioned not to impulsively conclude that climate is not a material issue because some of its threats and risks are thought to be long-term in nature. As specified in the Communication from the Commission Guidelines on non-financial reporting[10], companies should take into account their whole value chain, including both upstream in the supply chain and downstream, when determining the materiality of climate-related information.

It can be observed recently that the impacts of climate change are systemic and pervasive. Considering that fact, most of the companies falling under the Directive's scope can be expected to conclude that climate is a material issue. In case the companies conclude that the climate is not a material issue from their point of view, companies are advised to consider making a statement to that effect, explaining how such a conclusion has been reached. Amongst the examples of risks, causing negative impacts on climate are the following[11]: release of greenhouse gases directly into the atmosphere due to an industrial facility held by a company; purchased energy by a company for its operations, produced by using fossil fuels; the product company produces requires fossil fuels consumption, for example, cars need to consume petrol or diesel; the production of materials used by the company can lead to emissions of greenhouse gases up its value chain; for example, some companies use cement or aluminum in production activities, a company that produces and processes agricultural products or timber, whether it be in the food, apparel, or lumber industries, may be directly or indirectly responsible for land-use changes such as deforestation, forest degradation, and subsequent greenhouse gas emissions.

Risks to the company's activities and financial performance arising from climate change can be categorized as either physical or transition-related risks. Physical risks to the company arise from the physical impacts of climate change. The exposure of a company to physical risks does not directly depend on the circumstances of whether the same company hurts the climate. Amongst those risks[12] are: risks of excessive physical damage arising from certain events, especially whether a company's exposure to physical risks does not depend directly on whether that company hurts the climate events such as storms, floods, fires, or heat waves that can damage production facilities and disrupt value chains; risks of chronic, long-lasting physical damage that arise from longer-term changes in temperature, a rise of sea level, reduced availability of water, loss of biodiversity, and changes in land and soil productivity. Transition-related risks to the company are risks that arise from the transition to a low-carbon and climate-resilient economy. Such types of risks may

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[8] The EU Commission released (2019) the Consultation Document on the Update of the Non-Binding Guidelines on the EU Non-Financial Reporting Directive and introduced concept of "double materiality" that concerns the potential or actual impacts of climate-related risks and opportunities on company's performance, development and position regarded as "financial materiality" with audience investors, and the external impacts of company's activities regarded as "environmental and social materiality" with audience consumers, civil society, employees, and investors.

[9] The new EU Corporate Sustainability Reporting Directive (CSRD) will mandate over 50,000 companies in Europe.

[10] Official Journal of the European Union C 209/1 of June 20, 2019, "Communication from the Commission (EC) Guidelines on non-financial reporting: Supplement on reporting climate-related information (2019/C 209/01)", p. 1–30

[11] Ibid.

[12] Ibid.

be the following: requirements for energy efficiency, carbon pricing mechanisms raising the cost of fossil fuels, or laws encouraging sustainable land use could impact policy and generate risks; legal risks may occur due to lawsuits that could result from failing to prevent or minimize harmful climate consequences or failing to adapt to climate change; technological risks may arise if a technology with lower climate-damaging impacts replaces a technology with higher ones; market risks can arise if a consumer and business customer choice shifts to less climate-damaging products and services; reputational risks concern difficulties in attracting or retaining customers, employees, business partners, and investors because of the company's reputation for climate damage.

Generally, it can be expected that a company with a higher negative climate impact will be more exposed to transition-related risks. As regards the structure of the proposed disclosures, the Commission (EC) Guidelines on non-financial reporting: Supplement on reporting climate-related information, propose climate-related disclosures for each of the five areas of disclosure, described in the business model; the company's policies and due diligence process; the policy outcome; the principal risks and the management of risk; and the key performance indicators. The EC guidelines identify the limited disclosures recommended for each area of disclosure. An entity should consider the disclosures recommended to the extent necessary to understand the entity's development, performance, condition, and impact of its activities[13]. Companies decide whether to use the recommended disclosures and the detailed suggestions included under further guidance and to what extent. When deciding on the matter, companies should embrace the principles underlying good contemporary practices in non-financial reporting specified in the Commission's 2017 Non-Binding Guidelines on Non-Financial Reporting. The Guidelines include the requirements and principles concerning the disclosed information: *material*; *fair, balanced, understandable*; *comprehensive but concise*, *strategic and forward-looking, stakeholder orientated*, *consistent, and coherent.*[14]

Over the recent decades, influential international organizations and reporting initiatives have made tremendous efforts toward achieving sustainable development goals. Each organization is focused on its aims and specific objectives; its conceptual framework is based on principles similar to a certain extent to other framework principles, but not fully aligned, or at least its philosophy is not identical with the philosophy of other similar frameworks; the audience, users and targets of the guiding recommendations are also not the same. The organizations diverge in their approach that depends on which stakeholder group the activities are focused on. At the Ethical Corporation's Responsible Business Summit (New York 2018) it was emphasized that investigating how each reporting framework defines "materiality" for a business is one of the greatest ways to comprehend the key distinctions between the reporting frameworks. As it is stated in the quoted article, "GRI and SASB complement each other nicely on this front," – Mohin pointed out (June 27, 2018). "Materiality to GRI is outward looking since it refers to the impacts of the company on the world around it". As regards SASB, SASB's materiality focuses on the impacts of topics of sustainability on a company's financial condition or operating performance, proposing a more inward-looking approach (Helle Bank Jorgensen, 2018, Reuters Events). "They are converse, while complementary," – Mohin argued. CDSB's members consider equally how the organization affects the environment and how the environment influences the organization. The IIRC's members consider a matter to be material (significant) if the matter could considerably affect the organization's ability to create value in the short, medium, or long-term perspective.

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[13]   In addition, Annex I, provides further guidance for banks and insurance companies.

[14]   Official Journal of the European Union C 215/1, Communication from the Commission Guidelines on non-financial reporting (methodology for reporting non-financial information) (2017/C 215/01), pp. 1–20

The question arises of what the major contribution and mission of each of the worldwide leading organizations are regarding the problem crucial for the article. Due to its activities throughout several decades, the influential International Accounting Standards Board (IASB) *contributes transparency, accountability, and efficiency primarily to financial markets and investors thus fostering trust, growth, and long-term financial stability in the global economy*. The Carbon Disclosure Project (CDP) *focuses on investors, companies, and cities through an urgent course of action that aims to create a truly sustainable economy*. For comparison, the mission and the goals of the Climate Disclosure Standards Board (CDSB) are to make it possible for *significant information about climate change and natural capital to be included in mainstream reporting that would improve the efficient allocation of financial capital and use of financial resources*. The Sustainability Accounting Standards Board (SASB) aspires to improve investors' ability to make decisions to support value creation. The International Integrated Reporting Council (IIRC) seeks *to harmonize corporate behavior and capital allocation with the overarching objectives of financial stability and sustainable development*. The Global Reporting Initiative (GRI) *aims to enable decisions that benefit everyone in terms of social, environmental, and economic benefits*. As the foundation for enabling trade, the International Organization for Standardization (ISO) *works to develop high-quality, secure, and effective products*. Therefore, *further alignment is globally necessary* – a more complete alignment of the principles and targets of the conceptual frameworks focused on sustainability and sustainable development, and if it is achieved it will bring greater progress towards sustainability and sustainable development. "Moderately optimistic assumptions could be made that the climate changes will drive the world towards a technological leap and will remain a challenge, which will most probably bring about innovations and improvements in technologies" (Oreshkova, 2013, p. 52). It may be suggested that discovering appropriate solutions will create new opportunities for innovation in present-day technologies, economies, and societies.

The increasing societal and institutional concern arising from climate change regards present and probable future impacts on business entities, financial institutions, and other organizations and their activities examining and applying different standards and frameworks focused on sustainability reporting. Usually, the aim was to identify which of the frameworks would best articulate their specific climate-related risks and strategies to stakeholders. It was publicized (2019) that *climate-related reporting frameworks are highly but not fully, [author's note] – aligned* (Tho, 2019). The report prepared by the Corporate Reporting Dialogue (CRD) was a part of a two-year study named "The Better Alignment Project", which found alignment between the TCFDs recommendations and the global organizations' frameworks and standards on sustainability reporting even stronger than it was expected.[15] The technical mapping of the report found that the participants' standards and frameworks are harmonious and complementary with the seven principles for effective disclosures of the Task Force on Climate-Related Financial Disclosures (TCFD), i.e., *disclosures should provide **relevant information**; disclosures should be **specific and complete, clear, balanced, and understandable**, and **consistent over time, comparable among organizations within a sector, industry, or portfolio**; disclosures should be **provided on a timely basis***[16], and with the 11 disclosures recommended by the TCFD – on governance, strategy, risk management, and metrics and targets – comprehensively covered by the participants' frameworks and standards. 80 % of the TCFD's 50 metrics are fully or reasonably

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[15]   The Global Reporting Initiative (GRI), the International Integrated Reporting Council (IIRC), the Sustainability Accounting Standards Board (SASB), and CDP were the parties involved in the investigations, comparative analysis, and report preparation.

[16]   TCFD Final Report 2017. Recommendations of the Task Force on Climate-related Financial Disclosures, June 15, 2017

covered by CDP, GRI, and SASB indicators, and of all CDP, GRI, and SASB climate-related indicators, 70% have no material differences from the TCFD's 50 metrics (Tho, 2019). Mackintosh, chair of the CRD and a former vice-chairman of the IASB pointed out that because the Task Force has been attaining a lot of traction and many companies are interested in using the recommended metrics in their corporate reporting, the study examined the participants' frameworks against the TCFD's recommendations. Mackintosh fairly remarked that TCFD has been quite successful over the years. The TCFD's framework rests on four pillars: ***governance*** of climate-related risks and opportunities, the board's oversight and management's role in assessing and managing such risks by both the investors and companies; ***strategy*** regarding the risks and opportunities posed by climate change, how the allocation of assets is affected, and the processes investors use to assess performance; ***risk management*** regarding the processes investors follow to measure, monitor and manage climate-related risks; ***metrics and targets*** regarding measures used by investors to manage their climate-related risks and opportunities.[17]

The vast majority of both preparers and users of corporate report information are unsure how reporting frameworks and standards on sustainability in the market complement or differ from one another – whether in terms of comparability, materiality, definitions of [terms and – *author's note*] terminologies, or the used metrics, according to a survey found in the same report (Tho, 2019). Considering the views and attitudes of preparers, investors, funders, and regulators, Mackintosh argued, "It would be much more preferable to have one set of standards, which everybody could understand and use and would be comparable across companies, industries and countries" (2019). In light of such a high level of alignment, the crucial question arises of which framework or standard should a company apply. Mackintosh recommended three important things to be examined: whether a framework can be compared to other frameworks, what is material (significant) to the company, and what the company hopes to achieve with climate-related disclosures. "But – as Mackintosh admitted – he does not think that there's a straight answer to the question," adding that a Corporate Reporting Dialog report's section gives some answers. "There's still a lot of crossover and potential for confusion" – Mackintosh admitted (2019). Undoubtedly, the approach of each company or organization should be tailored to the nature and specifics of its activity and the particular risks that the activity and inherent assets face due to climate change, and the risks that the activity itself creates regarding climate.

4. THE INNOVATIVE PROPOSALS FOR CLIMATE-RELATED DISCLOSURES MADE BY THE U.S. SEC, THE ISSB, AND THE EFRAG

Progressive proposals for reporting standards on climate-related matters have occurred recently – the U.S. Securities and Exchange Commission's (SEC's) proposal for *"The Enhancement and Standardization of Climate-Related Disclosures for Investors"* of March 2022 (with comments expected by June 17, 2022), the International Sustainability Standards Board's (ISSB's)[18] *"[Draft] IFRS S-2 Climate-related Disclosures"* of March 2022 (with comments expected by July 29, 2022), and the European Sustainability Reporting Standards (ESRS) of April 2022, developed by the European Financial Reporting Advisory Group (EFRAG) *"ESRS E1: Climate change"*.

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[17]   Net-Zero Knowledge Hub (2022) Your Net-Zero Strategy Aligning with TCFD recommendations: Climate-related financial reporting, July 2022

[18]   On 3 November 2021, the IFRS Foundation announced the ISSB to meet demands for high-quality information on climate change and other environmental, social, and governance issues rising among investors with international investment portfolios, and to provide a worldwide baseline of sustainability-related disclosure standards to support capital market participants.

The SEC has a unique position in the financial reporting regulatory landscape in the United States. On 21 March 2022, the supreme regulatory institution on the front line of financial reporting[19] in the U.S., the U.S. SEC, proposed rules to enhance and standardize climate-related disclosures for investors. The significant changes would require registrants to include climate-related disclosures on certain matters in the statements and periodic reports incorporating information about climate-related risks that are likely to affect their businesses, operational results, and financial condition materially, and certain metrics in the note attached to the audited financial statements. It would force disclosure of greenhouse gas emissions, which has turned into a commonly used metric to assess a registrant's exposure to such risks. In topical publications, it is pointed out that the SEC's course of action and programme are politically influenced. Well-known is the fact that amongst Republicans the existence of climate change is denied as well as the assumption that climate change is a result of human activity, "thinking that market forces and technological innovation will bail us out" (Eccles, 2022).

The analysis reveals much more similarities between the three proposals than differences, which is encouraging (Eccles, 2022). However, "some of the differences are important," – Eccles argued. On the question of the likelihood of a future global framework and standard for disclosure on climate-related issues, Professor Eccles is rather an optimist since he considers *"the groundwork is being laid for a truly global standard for climate-related disclosures,"* (Eccles, 2022) and specifics caused by the necessity to consider nuances of various jurisdictions' laws, rules, and customs can be expected. Eccles's hypothesis is based on a dependable report recently released by the SustainAbility Institute ERM (ERM) and Persefoni grounded on a comparative analysis of all three proposals[20]. It is revealed that a considerable convergence is achieved between the new climate-related disclosure frameworks. Specifically, the rules proposed by the U.S. Securities and Exchange Commission (SEC), the EU European Financial Reporting Advisory Group (EFRAG), and the IFRS Foundation's International Sustainability Standards Board (ISSB) are thoroughly discussed. However, it is concluded that an opportunity for greater harmonization exists and if it is achieved it would improve both comparability and quality of disclosure related to climate change. "…and lack of common reporting requirements has led to a *proliferation* of standards in response to investor and other stakeholder demands for more climate-related financial information… resulted in an *'alphabet soup of standards…'* difficult to navigate, with both issuers and investors calling for convergence and harmonization" (ERM, 2022).

Organizations occupying different positions in the international regulatory landscape developed the proposals. As highlighted, the SEC's proposal[21] focuses primarily on protecting investors advancing in publicly traded companies in the U.S. and relates to all SEC registrants comprising foreign private issuers. On April 21, 2022, guidance on a range of requirements concerning sustainability-related disclosure was released, including the European Sustainability Reporting Standards (ESRS). The objective of the [Draft] ESRS E1 *'Climate change'* as stated, is for requirements to be specified to enable sustainability statements users to understand the enterprise's strategies,

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[19]   Under the U.S. securities laws, the U.S. SEC not only has the authority to establish accounting standards to be followed by public companies but also the power to enforce standards. The SEC has looked for leadership in establishing and improving the accounting principles to be applied to prepare financial statements to the private sector, since its inception. The Financial Accounting Standards Board (U.S. FASB), which has the power to set, but not to enforce, accounting standards to be used by public companies, performs that function.

[20]   The SustainAbility Institute by ERM (ERM) and Persefoni (2022). The Evolution of Sustainability Disclosure: Comparing the 2022 SEC, ESRS, and ISSB Proposals, 9 June 2022

[21]   U.S. SEC (2022). "Enhancement and Standardization of Climate-Related Disclosures for Investors, March 21, 2022

policies, actions, etc. For example, how does the enterprise impact climate change and cause effects (actual or probable, positive or negative); previous, ongoing, and planned actions to comply with the goal set by the Paris Agreement to keep global warming to 1.5 °C; strategies, policies, and ability to modify the business model(s) and activities in the transition to a sustainable economy and help keep global warming to 1.5 °C; actions or activities to avoid, mitigate or remediate adverse impacts, and specific outcomes; essence and extent of the undertaking's material risks and opportunities arising from its impacts and dependencies on climate change; effects of risks and opportunities, related to the undertaking's impacts and dependencies on climate change, on its development, performance, and position over short, medium and long term, and enterprise's ability to create value.[22] The new EU Directive, which will ultimately have an impact on all large undertakings in the EU, on companies with EU listings, and non-EU companies with EU subsidiaries, will be supported by EFRAG's proposal. The EFRAG's ESRS proposal is based on the concept of double materiality – how matters of sustainability affect reporting entities and how entities' activities affect the environment and society. The IASB and the new ISSB do not have the authority to compel disclosure. Rather, as standard-setters, the Boards' primary responsibility is to develop standards for reporting on sustainability issues that different jurisdictions and regulators might accept and adopt, or might not, or otherwise employ in the rulemaking process. The analysis of the most recent proposals reveals an increasing alignment of the frameworks for climate-related disclosure. It is essential for creating a uniform baseline for requirements and reporting practices procedures globally because may have a substantial impact on climate-related information quality leading to improved insights and decisions. Crucial takeaways of the comparative analysis in the report prepared by the SustainAbility Institute by ERM and Persefoni[23] are considered the following: the guiding rules developed by the U.S. SEC, EFRAG, and ISSB, are considerably improved; evolving engagements among international experts and organizations dedicated to environmental, social and governance issues, sustainability, and climate change improve the overall background specifically for disclosure of quantifiable data about greenhouse gas emissions; for the moment, companies should focus on the TCFD's framework applied across industries and types of organizations underlying the three proposals intended for helping companies to evaluate climate-related financial risks and opportunities.[24]

The alignment in the proposed frameworks for disclosure of risks and opportunities climate-related supports companies to navigate such a complex landscape and comply more effectively with requirements. The global process of alignment on climate disclosure guidelines influences positively the overall quality of information, to the benefit of both companies and investors. "… further harmonization… supports the development of a clear global baseline for climate and broader ESG-related disclosure requirements,"[25] which will not only have the benefit of making disclosures less complicated but be more widely accepted as well (Kawamori, 2022). The SEC's, EFRAG's, and ISSB's proposals are constructed on the same foundation – the Greenhouse Gas Protocol and TDFC's recommendations (Wyatt, K., 2022). Discussing the proposals, R. LaCount admitted that important differences remain. Therefore, companies must reasonably

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[22]   EFRAG PTF-ESRS [Draft] ESRS 1 Climate change, Exposure Draft, April 2022

[23]   ERM 2022. New report helps companies and investors make sense of proposed climate disclosure standards, 9 June 2022

[24]   "More companies will disclose emissions (Scope 1, 2, and 3): This will increase the amount of available data and facilitate reporting over time. In particular, as more companies report their Scope 1 and 2 emissions data, Scope 3 reporting will become easier and more reliable," (Quoted following ERM 2022, "New report helps companies and investors make sense of proposed climate disclosure standards", 9 June 2022, ERM 2022).

[25]   ERM 2022. New report helps companies and investors make sense of proposed climate disclosure standards, 9 June 2022

consider what is required to adhere to the appropriate guidelines and follow accurate business and governance strategies, policies, and processes. Companies that proactively address strategies for climate change will gain a competitive advantage because will be responsive in spotting and acting on opportunities and reducing risks. The Commission (EC) highlighted probable benefits expected from providing climate-related information by increasing awareness and understanding of climate-related risks and opportunities, diversifying the investor base, creating a lower cost of capital, and improving constructive dialogue with stakeholders.

5. CONCLUSION

The thesis that greenhouse gas emissions pose considerable risk to the global economy is widely maintained. Its supporters claim that such emissions affect and will continue to have a strongly negative impact on numerous economic sectors. It is expected communities of investors and creditors (present and potential), employees, and other interested parties, to increasingly need credible information about companies' business activities mostly exposed to risk arising from climate change, and companies that generate risk concerning climate due to the nature of their activities. Therefore, it is necessary to know to what extent companies are organized to incur impacts and unfavorable effects of evolving aggressive phenomena due to climate change and to what extent companies are prepared to take appropriate future actions for prevention.

The role of civil society will also be of crucial importance. Civil society members should have morality, awareness, interest, and desire to require an adequate response to the global necessity of comprehensive qualitative disclosures about climate-related matters. The disclosure efficiency will mostly depend on the priorities and concerns, the insight and responsibility of executives at the highest levels of corporate governance and management.

Climate change is turning into a substantial factor influencing significant investment decisions regarding the allocation of financial capital globally. Investors are increasingly trying to navigate climate risk and gain an advantage and benefit from climate transition. It is not surprising that the new proposals occur in a period of flourishing climate-related disclosure regulations worldwide. Over the most recent decades, remarkable progress has been achieved as the global baseline for disclosures on climate-related matters was settled. However, a long way is still to go ahead to reach the extent, to which the regulatory basis for international financial reporting is developed.

The present-day forward-thinking philosophy and concern about the global necessity of proper solutions for combatting climate change should be developed and raised to a qualitatively new level. The appropriate actions for mitigation of and adaptation to climate change are considered an effective strategy for a sustainable future world that can reduce probable negative effects as well as the manifestation of climate-related risks and vulnerability of people, ecosystems, and biodiversity; however, beyond certain levels of global temperature, adaptation will no longer be possible for some species. Climate change poses unique challenges to humankind. Another key argument is that climate change can be regarded as an exclusive chance for creating new opportunities. Proper solutions will probably discover opportunities for innovations in technologies, economies, and societies, in favor of climate-change mitigation.

The goal of developing international standards for climate-related disclosures of high quality, designed to be uniformly and universally applied should be regarded as the highest priority for constituting a comprehensible regulatory basis for corporate reporting on sustainability.

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Modern Management:
The Biggest Challenge of an Era Full of Changes

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Abstract: *The 21st century was marked by countless changes and upheavals around the world that very much revealed a new age. This era of fast, sudden, and omnipresent change has serious implications for our future. In today's fast-paced world, each organization needs new tools and methods to strengthen its effectiveness. Strong competition in the worldwide marketplace requires organizations to figure out ways to be competitive. Competitive advantage is achieved only by organizations that are ready for extreme changes and employ techniques and concepts of non-stop improvement. In order to obtain a competitive advantage, the context of continuous quick globalization, change, and development drives fresh ideas about the modes of activity and roles of organizations. One of the most crucial human activities is management. Since the beginning of time, when humans formed social organizations to achieve goals and objectives that they could not achieve as individuals, management played a vital role in ensuring that individual efforts were coordinated. What is now happening compels managers to employ more modern, contemporary techniques and manners of management to meet current issues. New management strategies, such as a process-oriented approach, are necessary. Modern management is the foundation for creating a successful, market-competitive organization. To answer these issues, the study will focus on analyzing management theories and particular elements that separate today's management from previous eras. Therefore, managers in modern businesses must recognize the critical role they play in helping their organizations accomplish their objectives. For this goal to be achieved, it is vital to apply modern achievements and technology in organizational management. Our paper's purpose is to demonstrate how management has grown up in an ever-changing organizational environment. To solve these challenges, researchers need to broaden and expand their attention to the process approach as a way of enhancing the organization's management system and developing recommendations for maximizing crucial business processes. These events have had an impact on the organizational world, and it is up to management to refresh, modernize and rise to face the challenges.*

1. INTRODUCTION

Management principles and theories have undergone major changes and significant transitions through different epochs in history. These alterations have majorly been influenced by emerging criticism and changing times, which have necessitated the adoption of matching strategic leadership plans that can resonate with every period in history. Normally, every new period in history comes with many challenges and opportunities; therefore, leadership adjustments have to be pursued to allow institutions to take full advantage of the new period while overcoming the drawbacks that these changes present to extant approaches (Anjum & Zahan, 2021).

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This underscores the need for change to keep the organization germane to the unfolding changes and compete favorably with the other players under the same category. Peering back into history, the management realm has undergone sweeping alterations and seismic shifts, which have been occasioned by changes in social dynamics, leadership transitions, economic crises, and changes in monetary policies (Wren & Bedeian; 2020 Ferdous, 2016). All these have had a major impact on the shape and stability of managerial roles, thus occasioning leadership adjustments. As mentioned earlier, each new period brings along both exciting and disadvantageous changes and more so impacts the established managerial framework negatively. In the recent past, the world has experienced notable events which have rocked the corporate world, leading to major wealth transfers, the closure of big businesses, and the loss of shareholders; capital, apart from the massive retrenchment that has been witnessed during these stressful periods. For instance, the management suffered through the 2008 economic downturn and the Great Depression. Most recently, the COVID-19 pandemic has affected the way businesses conduct their activities. During the pandemic period, when governments across the globe imposed stringent rules limiting movement and people interaction to curb the spread of the deadly and highly contagious disease, the management suffered massively. This is because it was subjected to unplaced recalibration and process adjustments to enable the business to match the specific challenges of the problems (Vavrek et al., 2019).

The stated examples are true examples of the shifts that have occurred in management and leadership following the occurrence of outliers in the economy. Initiating change in relation to the shifting times is core to remaining relevant and competitive, thus enabling the management to perform at the optimal state. All through this period, management practices have undergone major challenges in the attempt to overcome the presented obstacles. Therefore, the paper shall discuss how modern management has been shaped and affected by societal dynamics, thus posing challenges in the ways that these businesses run their activities in the current highly competitive working environment.

2. LITERATURE REVIEW

According to Mundi et al. (2020) who investigated the history of management, it is investigated and traced back to the dark ages when humans survived by hunting and gathering. During these times, when there was no government, modern technology, or established institutions, management played a critical role in establishing organized hunting and maintaining peace among the people. As a result, this body of research highlights the fact that management is both a vital component and an instrument in the process of coordinating efforts. In addition, given the fact that our society is getting ever more crowded, the position of management has taken on a significance that is both significant and unavoidable. In addition, the management of people has become increasingly complex, which necessitates the development of more strong processes in order to achieve seamless leadership. It was revealed in these publications, which were prepared with the intention of demystifying the dynamics of management and leadership, that management has a transforming impact on the social and economic elements in developed countries. In addition, management has been a crucial pillar in the construction of the global economy, as well as the creation of regulations that govern how the parties interested in participating in the global economies ought to work. In addition, the book sheds light on the transitions and evolution of theories that have occurred in management throughout history to create powerful and appropriate managerial frameworks for every circumstance. Because management is intertwined with other fields like mathematics, statistics, and psychology, the discipline has gotten more difficult to study as the world

continues to observe significant advancements in science and technology. This pattern may be traced back to the 20th century when there was a disproportionate burst of an avalanche of managerial theories (Hussain et al.,2019). In that era, there was also an increase in the number of management consultants. Even though these components have become indispensable to management, the challenges and complexities of management have only increased as a result.

According to the findings of a study conducted by Jean-Etienne (2018), the objective of which was to locate the beginnings of management theory, there has been relatively little research and development in the field of managerial matters in comparison to the paradigm-shifting steps that have been taken in engineering. This author has provided a thorough analysis of the significant efforts that were put forth in the direction of the development of the management theory. This required the participation of well-known thinkers like Taylor and Adam Smith, among others. In addition, the article investigates the unspoken connection that exists between the levels of coordination that exist between workers and their supervisors and the levels of productivity that exist in the workplace. The development of the theories was significant because it attracted many managers who were interested in the incredible promise that scientific and managerial practices had an impact on transforming companies, which in turn led to higher rates of productivity. These managers were attracted by the amazing promise that scientific and managerial practices had an impact on transforming companies. Jean-Etienne (2018) details the numerous efforts that previous business scholars have made in an attempt to pinpoint the precise period in history when management as it is practiced today first emerged.

According to Pulakos et al. (2019), the 20th century is considered to be a special period in the age of management. This is because the 20th century coincides with the period in which major theories, principles, and theories pertaining to management were established, thereby marking new heights in management standards. It was during this period that historians, philosophers, and management scholars strove to provide a blueprint for the establishment of future firms and were the primary sources of inspiration for new management theories. However, the 1980s and 1990s marked a period when the management rules and principles of the 20th century were dropped, paving the way for fresh ideas in the world, which ushered in regime changes and major economic transformations with stronger economies emerging in the Asian block. This was a time when the world was ushering in major economic transformations with stronger economies emerging in the Asian block. Management in the 20th century consisted of following a set of rules and having certain principles that guided practice. In addition, the publication offers readers a more in-depth understanding of the history of management by analyzing its application in various eras throughout history, such as the coordination of personnel involved in the construction of ships. Although the term "management" has only been around for a relatively short amount of time, there is a striking similarity between the methods that people used when they were constructing tombs and the methods that are used in contemporary planning. In the end, management is something that has been constructed through the gradual growth of practices into the complex ideas and principles of leadership that are present today.

McKiernan (2017) offers a comprehensive analysis of the development of managing theories from the classical era up through the present-day management practices. The author emphasizes that there is a need for modern managers to examine the trends in past managerial practices and principles in order to enable them to predict future changes with a higher degree of precision. This is because the modern manager is expected to be able to handle a wider range of complex problems. In addition, McKiernan (2017) is of the opinion that the current managerial inefficiencies can be

effectively addressed by applying the ideas that were established by the predecessors. In addition, the author maintains that if a person is knowledgeable about the theories and principles of management, they are more likely to act in a structured manner inside the established framework, which in turn increases the likelihood of successful business endeavors being undertaken (Pulakos et al., 2019). Examining and paying attention to the history of management provides a foundation for effective leadership and management since management is a science that developed throughout history through a combination of research and practical experience. As a result, the lofty ideals that have coalesced around leadership are valuable in giving a basis for leadership in the present day.

There hasn't been a lot of research done, despite the fact that there is a lot of evidence about the development of managerial ideas throughout history. This is because there isn't much research done about how more elaborate modern leadership principles can be connected with the older concepts, which would result in stronger leadership. In addition, there is a void in research regarding how the ideas of the past might be helpful in finding solutions to the problems that are faced in modern management. In a similar vein, there is a dearth of research on topics that pertain to how management concepts have been utilized in the past in order to tackle historical issues such as the great depression.

3. METHODOLOGY

This paper has majorly drawn its supporting evidence from a broad range of credible scholarly sources. These are materials containing scientific research from different periods in recent human history, thus mapping the issue into its real position. Moreover, using evidence from different times allowed the examination of the research evolution that has occurred throughout history. Similarly, using sources from different scholars provided a basis for the evaluation of facts and establishment of common facts, thus examining the consistency of the research. Therefore, it majorly focused on secondary sources for reducing the study period while allowing the integration of various studies, which leads to more plausible conclusions.

4. RESULTS

There has been a major shift in management strategies when compared to the previous management techniques. While the past management practices were based on theories and principles, the 21ˢᵗ century has been greatly influenced by technological improvements that are becoming complicated by the day. Moreover, it has been found that the past theories and practices in management are essential determinants of them as they provide and backdrop for establishing a stronger future leadership (Khorasani & Almasifard, 2017). However, due to the stated technological advancements, past strategies cannot be fully reliable in managing modern-day issues but can provide useful information about the estimated projection and ways in which businesses should respond to uncertainties (Wilson & Campbell, 2020). Additionally, in the past, the subject of management research was undertaken by scholars from diverse subjects. Throughout history, management has been an important subject as it has enabled people to work in a coordinated manner, thus realizing their objectives. Therefore, management is a product of continuous research and accumulated evolution of theories to the management seen today. The point that management is crucial in coordinating working plans makes it an essential element in the modern workplace where workplace responsibilities are group-based, requiring management to keep the operations smooth. However, great breakthroughs in management can be traced back to the 20ᵗʰ century, when many scholars began to gravitate toward management to fill the research gap (Dahlgaard-Park et al. 2018).

Moreover, the financial crisis that coincided with the same period has been essential as they have laid the ground for establishing a strong policy and strategic plan for combating challenges. Ultimately, the past lays the ground for the formulation of future strategies and assists in determining the possible and most pertinent approaches that can be applied in theory and practice.

5. DISCUSSION

Since World War Two and the subsequent eruption of the cold war, the world has experienced transitions in technology. Moreover, establishing the United Nations was a major and tremendous step in restoring world peace, thus setting up a free economy where businesses can operate across the border. While this was an advantage in enabling coordination of businesses while creating unlimited access to a huge pool of customers across the border, it was detrimental to the operations as it marked the beginning of the global competition, exposing the weak and vulnerable economies to the huge trade deficits (Reijers, 2021). Against the above background and the available literature, modern management has become quite complicated, thus requiring more structured approaches to dealing with global problems. The present-day managers have the responsibility of providing the needed managerial competence for dealing with the unfolding challenges in management, which are bigger and more sophisticated in the globalized market (Belyaeva, 2018). Therefore, management requires multipronged and holistic attention to all the aspects of the economy and the past practices in running businesses.

Most recently, there has been a shift and revolution of theories as managers attempt to come up with leadership approaches pertinent to the dynamics of the 21st-century marketplace. One of the notable transitions is the shift from bureaucratic leadership to a transformative managerial approach for aligning with the current need for the involvement of all players in the business (Wawak & Woźniak, 2020; Amankwah-Amoah & Wang, 2019). While the former was based on a hierarchical approach with the top management and a downward chain of command, leaders are shifting to the latter to allow sharing of ideas and enable each employee to share with the management (Benson & Peprah, 2021; Boone et al., 2019). This system has been useful in sharing the goals and objectives of the business, thus infusing a sense of autonomy in the operations. Through this, everyone feels part of the management and is aware of the expected and shared goals of a company. Hence, this makes it easier to work towards the realization of the goals of the organization.

While management and the affiliated theories have been extant in history, they have not matched the scope, magnitude, and complexity of the current managerial practices. Ties are changing, and so is the role of a manager in businesses (Seifzadeh & Rowe, 2019; Veloutsou & Guzman, 2017). Essentially, these tasks morph into demanding responsibilities related to decision-making and problem-solving. Moreover, managers have the noble role of designing and maintaining a suitable environment and a thriving atmosphere for the optimal operation of employees (URI-NOV, 2017). In brief, managerial roles have expanded to match the prevailing requirements. Additionally, modern management has further expanded to encompass principles such as coordination, strategic planning, directing, and exercising control over large and complex decision-making processes (Kužnin & Walker, 2017). The roles of a major are therefore more delineated but more complex than the ones of the predecessors.

In the contemporary, managers are faced with bigger challenges than their predecessors due to the presence of free-trade policies and a globalized market. In parallel, citizens have been empowered by the 21st-century technological advancement, which has birthed social media, a powerful

communication tool that allows seamless and seamless conveyance of information. Therefore, customers have a good wealth of information about the market, thus placing businesses in a precarious state as the operations have to be conducted in an elaborate open, and transparent manner to prevent reputational damage (Virtanen & Vakkuri, 2016). Similarly, modern organizations are comparatively larger than the previous ones since some have overseas branches, complicating workforce operations and management (Palla & Billy, 2018). However, the same technology provides a useful opportunity for modern businesses (Pfano & Beharry, 2016). With the invention of powerful computers and equally powerful software, companies can now conduct their operation more smoothly than ever before (Rybicka, 2018). This allows, among other functions, employee management, progress forecasting, and financial management to be conducted easily and accurately (Vukotić et al., 2017). Moreover, new advanced software such as test gorilla has eased the employees' integration process. In parallel, the modern workplace allows managers to impose financial and non-financial controls to keep track of the movement of money and operations in general within an organization (Stone, 2016). Therefore, human resource management has undergone tremendous change leading to new levels of performance (Podgorodnichenko et al., 2020). However, there remuneration related issues due to an increase in minimum wages and consistent calls for better workplace conditions. This has increased operational costs in some cases. In response to this, machine learning and artificial intelligence have been introduced in the workplace to aid in mitigating the high wage rates and enabling robots to perform tasks that are too risky to be assigned to the human workforce, thus improving safety levels (Ziora, 2020).

6. CONCLUSION

A cursory reading reveals that the article presents a comprehensive study of management's development and the ways managerial difficulties have been met throughout history. According to what is discussed in the paper, management has been in practice for a considerable amount of time in history; however, the term "management" did not come into use until relatively recently, when corporate management began as a result of expanding economies leading to the formation of larger corporations. Nevertheless, the management principles and theories accessible today are the results of laborious and devoted research work carried out by a diverse class of academics. These academics have assisted in the formulation of strategies for manning employees and resources for the optimization of practices to keep businesses in the best state and shape possible. The most essential and detailed topic that this article has covered is the modern challenges that are faced by management, as well as the potential solutions to these problems. For instance, the modern business world is notoriously cutthroat due to the fact that almost everyone involved in management practices possesses an excellent understanding of the nuances of their position as well as the dynamics of the market, which contributes to the environment's high level of competition. The enterprises, on the other hand, are built on the foundation of contemporary technology. As a result of the most recent burst of technological innovation, managers now have a fantastic opportunity to make use of the readily available technologies, such as dependable software, in order to triumph over the challenges posed by the existing level of competition as well as the challenges posed by economic downturns. Notably, it has been determined that in order to realize seamless management, there is a need for an analysis of the past managerial practices and how they were effective in combating past uncertainties caused by events such as the Spanish flu pandemic, the great depression, the occurrence of two major world wars in the 20ᵗʰ century, and the tug of war between communist and capitalist policies. This is noteworthy because it has been determined that in order to realize seamless management, there is a need for an analysis of past managerial practices.

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SMEs Digital Transformation – Are We Ready?

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Abstract: *The paper presents the results of the analysis of the readiness of small and medium enterprises, VET providers, high education institutions and consultancy organizations towards digital and bionic transformation and acquisition of a "bionic status". The purpose of the paper is to find out which key skills and knowledge are needed for employees in order to be ready for digital transformation. SMEs that were a part of the survey operate in different economic sectors in various countries of the European Union (Spain, Slovenia, Poland, Croatia, Ukraine, Austria, Italy, Germany, Macedonia, Switzerland, Belgium, and Hungary). Other organisations such as public bodies, non-governmental organisations (NGOs), universities and technological centres also participated in the survey on digital competences. Key conclusions of the analysis indicate that almost all participants are familiar with the need for digital transformation, but that knowledge about 4.0 technologies is still lacking. The most significant knowledge is in robotics, 3D printing and Cloud Services, big data, and IoT. Blockchain and artificial intelligence are considered less important for digital transformation. However, a strong need for further education and training in all of these areas was expressed.*

1. INTRODUCTION

SMEs are the main driver of economic growth, innovation, job creation and social integration in Europe and the world's economies. The World Economic Forum predicts that global spending on the digital transformation of business practices, products and organizations is forecast to reach \$2.8 trillion in 2025 at a compound annual growth rate of 16.4% – more than double the amount allocated in 2020[5]. Digital transformation is well recognized as a key element for the future development of small and medium enterprises, but these enterprises will certainly face obstacles while implementing digital transformation. Digital transformation offers SMEs opportunities to innovate, and grow and furthermore can help, by conserving manpower, raw material and energy during the manufacturing process, production monitoring, improving yield, predicting customer needs, marketing adjustment and customer service. Therefore, the implementation of digital transformation can not only improve manufacturing efficiency but also can help companies in their productivity. In 2019, SMEs active in the digital sector (manufacture of computers, electronic and optical products, telecommunications, computer programming, consultancy and related activities and information service activities) posted stronger value added and employment performances than SMEs in the non-digital sector: 4.5% vs. 3.7% in the case of value-added, and 2.4% vs 1.3% in the case of employment.[6]

SMEs have a central role in this transition, not only because they represent the bulk of the EU companies, but also because they are a critical source of innovation.[7] That is why the European Commission has designed the Digital Europe Program to fill the gap between research and deployment of digital technologies. In Europe's digital transformation[8] the Commission proposes a Digital Compass for the EU's digital decade that evolves around four cardinal points: skills, secure and sustainable digital infrastructures, digitalisation of public services, digital transformation of businesses[9]. With the support of Digital Innovation Hubs and industrial clusters, by 2030, SMEs should have the opportunity to access digital technologies or data easily and on fair terms, ensured by appropriate regulation, and benefit from adequate support to digitalise. SMEs will work towards becoming high-value businesses by adopting digital technologies and smart manufacturing, making them the cornerstone for economic output and job creation in each economy.

In this paper, an in-depth study of knowledge related to digital transformation was conducted. An analysis of the current situation was carried out through a survey and the findings of the analysis will be used for the preparation of a new educational program that will enable the acquisition of new knowledge on digital transformation, Industry 4.0 for the bionic transformation of SMEs and enable the strengthening of management capacity to introduce change.

2. METHODOLOGY

The survey conducted was in form of a questionnaire and it was completed by 30 respondents.

The first part of the questionnaires regarding general information is the same for all participants and requires their nationality, gender, education and other general questions. In the second part of the questionnaire, SMEs rated the situation regarding digital transformation in their enterprises, while high education institutions and consultancy organizations expressed their opinion based on their experience and knowledge regarding digital transformation. In this paper, an analysis was performed based on the available scientific and professional literature.

The results of these research groups are presented in the following chapter.

3. RESULTS

As already mentioned, the questionnaire related to SMEs was divided into two parts, the first part regarding general information and the second part regarding knowledge and skills on digitalisation and 4.0 technology.

Out of 30 SMEs that were a part of this research, 11 are micro enterprises with less than 10 employees, 11 are small enterprises with 10 to 49 employees and 8 are medium enterprises with 50-249 employees (Figure 1). SMEs that were a part of the survey operate in different sectors, such as marketing, software, consultancy, industrial and intellectual property, sports medicine and management, automation, education, the metal industry, real estate, etc. However, most of the SMEs are related to the furniture sector, including upholstered furniture, kitchen furniture,

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7   An SME Strategy for a sustainable and digital Europe, COM/2020/103 final

8   https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52021DC0118

9   https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

custom furniture, indoor furniture, children's beds and components, and cabinet furniture. The roles of the participants in SMEs are also quite different and include owners, CEOs, directors, managers, software developers, technologists, sellers, administrators, and designers.
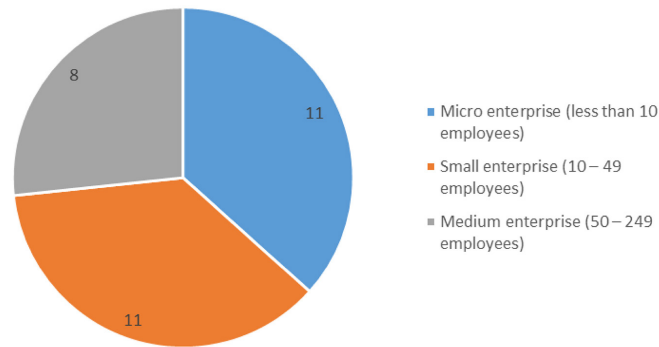
Figure 1. Size of SMEs
Source: Own research

Most of the respondents (34%) have 20 or more years of professional experience, followed by 15-19 and 10-14 years (23% each) (Figure 2).
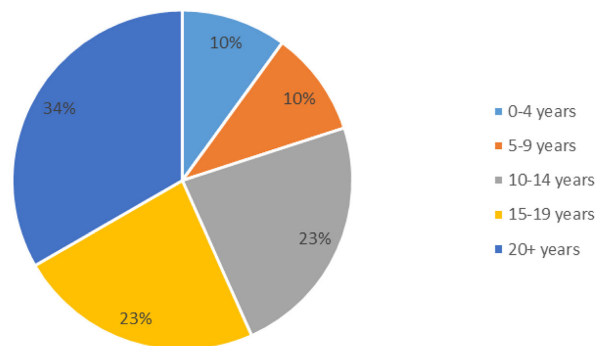
Figure 2. Professional experience
Source: Own research

The second part of the questionnaire, related to 4.0 technology started with the question of whether the participants are familiar with 4.0 technologies and the results show that 50% of the respondents are rather familiar with it, 40% are familiar, while only 3% (1 participant) are not familiar with 4.0 technologies (Figure 3).
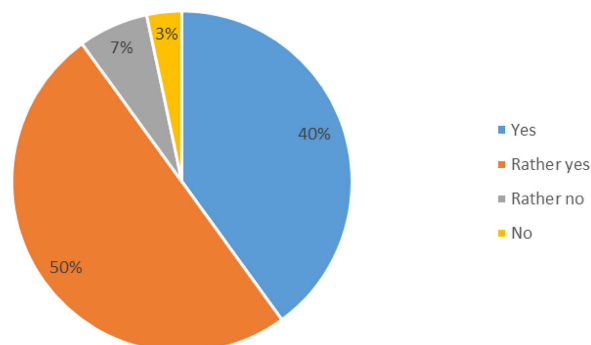
Figure 3. Familiarity with 4.0 technologies
Source: Own research

Additionally, 57% of respondents consider 4.0 technologies important for their sector, followed by 40% of them considering it rather important. No one considers 4.0 technologies not important (Figure 4).
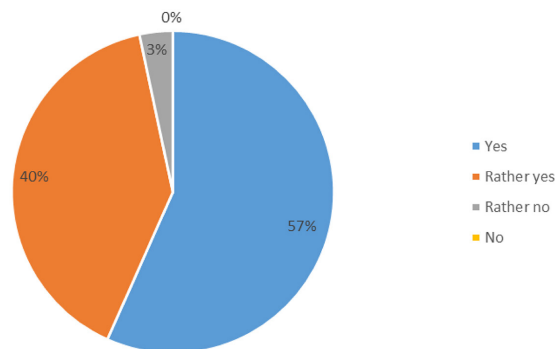
Figure 4. Importance of 4.0 technologies
Source: Own research

As the main barriers to the implementation of 4.0 technologies in the furniture and related sectors, most respondents, 70%, have chosen a lack of skills and knowledge among staff. Other main barriers include the cost of technologies (66.67%), lack of digital transformation strategy and leadership (53.33%) and reluctance to change and new technologies adoption (43.33%). The least number of participants as the main barrier consider lack of technological solutions from suppliers and further adoption of technologies (Figure 5).
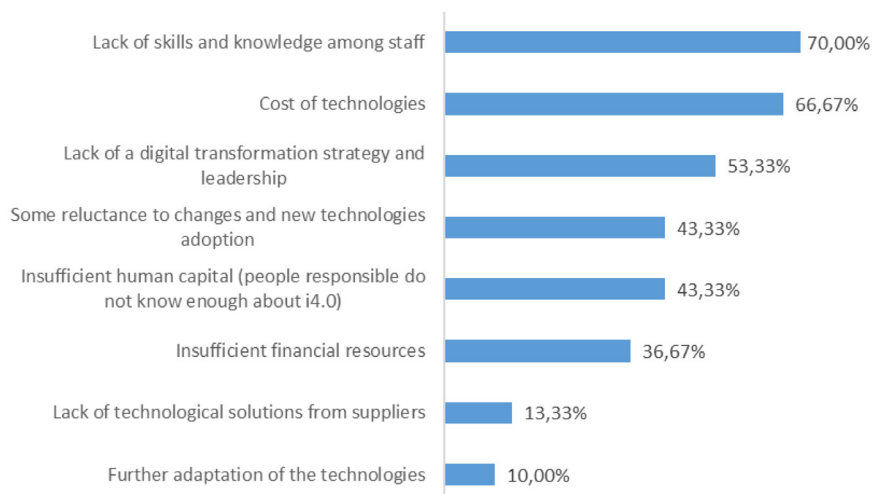
Figure 5. Main barriers to the implementation of 4.0 technologies
Source: Own research

The following set of questions analyses the situation regarding the readiness for digitalisation of SMEs. The set starts with the question of whether the SME practices an open culture of communication, which can help all involved understand and adapt to challenges with more ease. According to the participants, 23 out of 30 SMEs practices or rather practice the open culture of communication. Participants were also asked if they are aware of all the different risks their company is exposed to and most of them are rather aware (40%), followed by rather unaware (36.67%). None of the respondents is completely unaware of the risks their company is exposed to.

To the question of whether the company is regularly carrying out a comprehensive analysis of all company's strengths and weaknesses, 9 out of 30 respondents answered rather yes, 8 of them said rather no and 8 of them pointed out that company is not carrying out a comprehensive analysis of strengths and weaknesses. According to the respondents, 10 out of 30 SMEs are rather not equipped with a systematic inventory of all-important aspects of their current business model, while 8 of them are completely not equipped with it. Only 5 SMEs have a systematic inventory of all-important aspects of their current business model. On the other hand, most of the SMEs, 13 completely and 6 rather, have experience with methods of analysis, such as the SWOT analysis, that can support them to identify the development strategies with the biggest potential for success.

Furthermore, participants were asked whether the European Union's General Data Protection Regulation (GDPR) impacted their company and most of them, 43.33% said rather not, followed by 30% who stated that the GDPR impacted their company. Additionally, respondents were asked how it impacted their company and there were quite different answers, such as that GDPR complicates things, brings changes in the management system and necessity to organise data and data security differently, introduces new responsibilities, makes networking more difficult and requires permissions for sending surveys. To the question of whether the company listens to the fears of employees regarding digital transformation and are those fears analysed regarding their significance for a proper digital transformation process in the company, most of the respondents, 13 out of 30 answered rather yes, followed by 7 of them who answered rather no. Additionally, most of the participants, 18 out of 30 (60%) are rather able to present their ideas on how to measure the success of the company within their company team, followed by 7 respondents who are completely able to do it. Only 5 of the respondents are not able or rather not able to present their ideas within their company team. Also, participants of the survey were asked if their company has systematically prepared for the optimisation and upgrade of technology used, and 14 out of 30 participants answered rather yes, followed by 11 of them who answered rather no. The last question of this group analysed whether the company has already tackled the challenge of what a new, digital business model for the company could look like, and most of the respondents, 13 out of 30, answered rather yes, followed by 8 of them who said yes and 8 of them who said rather no. All the results regarding readiness for digitalisation of SMEs are presented in Figure 6.
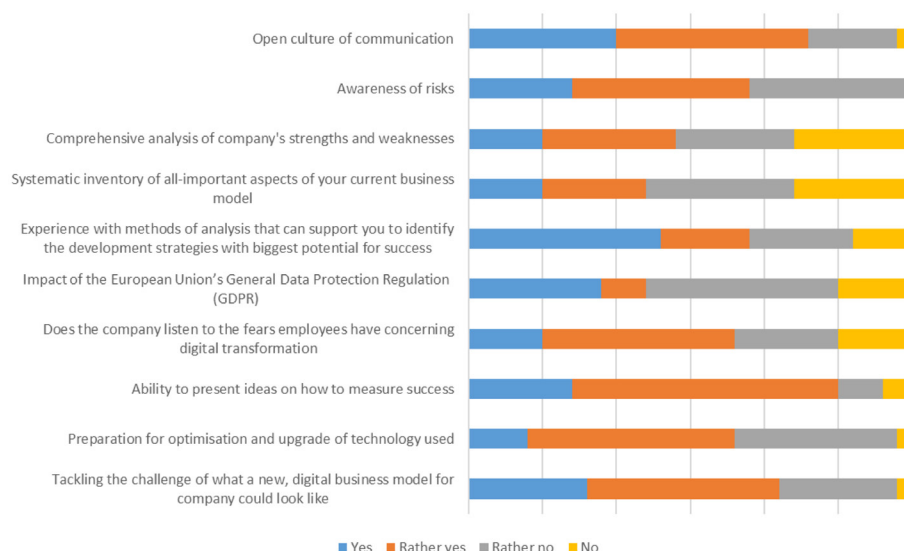
Figure 6. Readiness for digitalisation of SMEs
Source: Own research

The second part of the survey was related to high education institutions and consultancy organizations. The questionnaire was completed by 24 participants – 5 each from Croatia and Poland, 3 each from Italy and Germany, 2 each from Slovenia and Ukraine and 1 each from Austria, Belgium, Hungary and Spain (Figure 7).
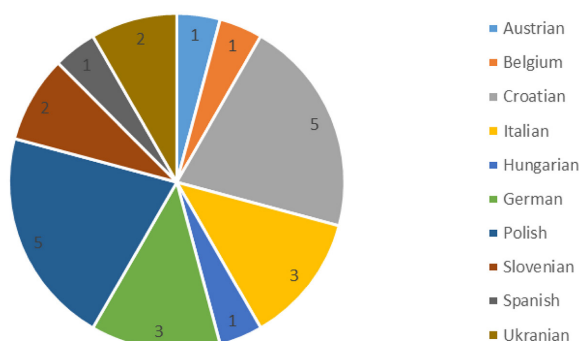
Figure 7. Nationality of participants
Source: Own research

Most of the participants in the survey are related to high education institutions and consultancy organizations, 71% are females and 29% are males (Figure 8).
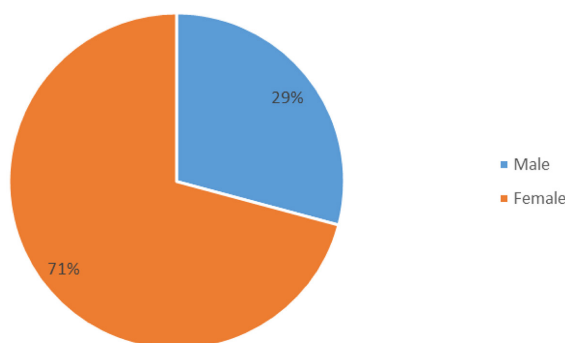
Figure 8. Gender of participants
Source: Own research

As in the previous part of the research, the second part of the questionnaire was related to 4.0 technologies and participants were first asked whether they are familiar with 4.0 technologies. Of most of the participants, 37% are familiar with 4.0 technologies, followed by 33% who are rather familiar and 17% who are not familiar (Figure 9).
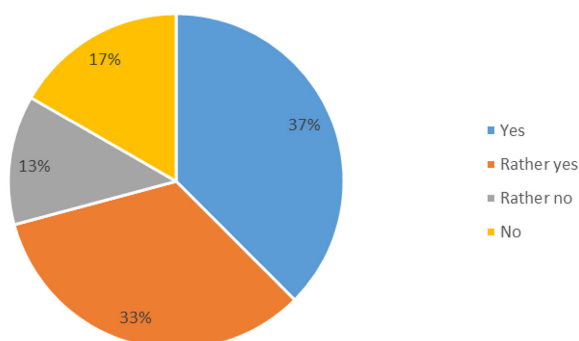
Figure 9. Familiarity with 4.0 technologies
Source: Own research

A Large majority of respondents, 67% think that 4.0 technologies are important for industry and especially traditional sectors, such as furniture, 29% of participants find it rather important, and 4% rather unimportant. No one thinks that 4.0 technologies are not important (Figure 10).
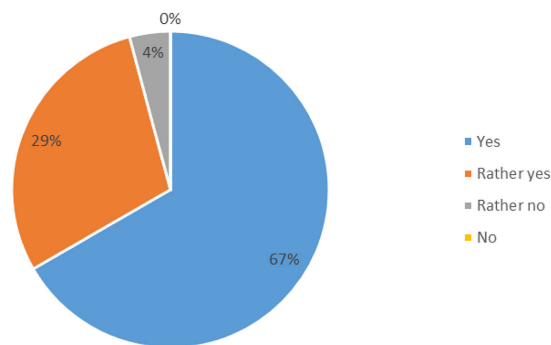
Figure 10. Importance of 4.0 technologies for industry and traditional sectors
Source: Own research

According to participants, the most important technology is robotics (70.83% of participants find it most important), followed by the Internet of Things (62.5%) and 3D printing and manufacturing (58.33%). The least number of participants (33.33%) think that Blockchain is the most important technology (Figure 11).
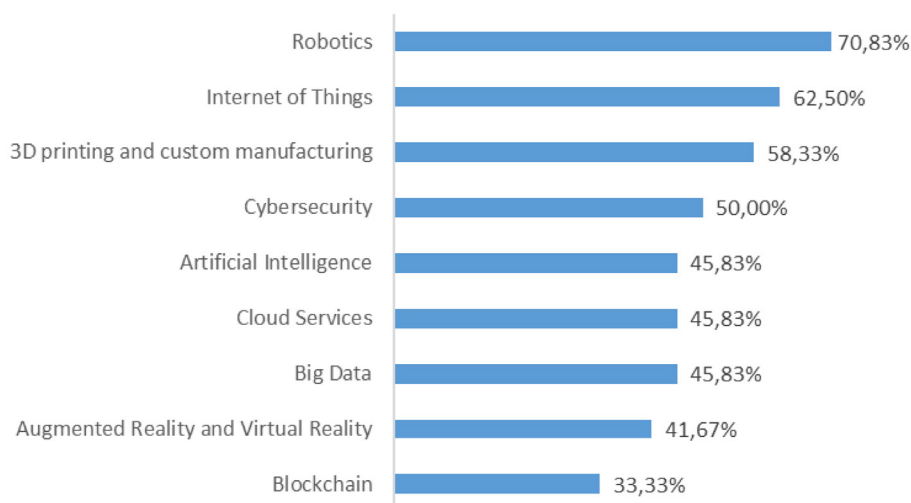
Figure 11. Importance of technologies
Source: Own research

The biggest barrier to the successful implementation of industry 4.0 technologies in the furniture and related sectors, according to the participants, is the lack of digital transformation strategy and leadership (66.67%). It is followed by a lack of skills and knowledge among staff (62.5%), reluctance to change and new technologies adoption (50%) and cost of technologies (50%) (Figure 12).

In the following set of questions, participants were asked to, regarding their experience, assess the situation in SMEs regarding the readiness for digitalisation. Firstly, the participants were asked to assess whether the companies from furniture and related sectors are equipped with a thought-out strategy for improving the online experiences of their customers (Digital customer experience, DCX). Most of the participants think that companies are rather not equipped with the strategy. Similarly, most of the respondents find that companies from furniture and related

sectors are rather not equipped with a thought-out strategy to optimise and obtain benefits of social media, while 10 respondents answered rather yes to this question.

Companies from furniture and related sectors, according to most of the participants rather do not have an open culture of communication so that challenges and successes in the course of digital change can be quickly and transparently made accessible to all those involved. Also, regarding the experience of respondents, most of them, find that companies from furniture and related sectors are rather not aware of all the different risks they are exposed to. Regarding the question of whether the companies from furniture and related sectors are regularly carrying out a comprehensive analysis of all the company's strengths and weaknesses, 14 participants answered rather no.
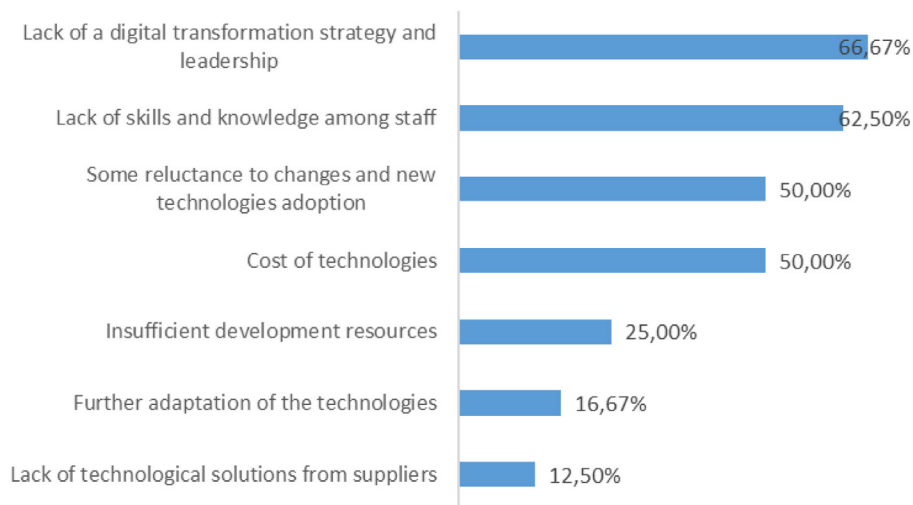
Figure 12. Main barriers to the implementation of 4.0 technologies
Source: Own research

Half of the respondents think that companies from furniture and related sectors are rather not equipped with a systematic inventory of all-important aspects of their current business model. On the other hand, answers to the question of whether companies from furniture and related sectors know the implications of the European Union's General Data Protection Regulation (GDPR) are quite diverse – 9 participants consider that they rather know the implications, 7 believe that they rather do not know, while 6 participants consider that companies know the implications of the GDPR. Most of the respondents believe that leaders of SMEs rather not consider the fears that their employees have concerning digital transformation and they rather not try to analyse those fears for the implementation of a proper digital transformation process.

Also, most of the participants, believe that companies are rather not systematically dedicating attention to all of the technological changes that could shape their branch of business in the future. To the question of whether they believe that companies already dedicated enough attention to the question of what a new, digital model for their company could look like and which customers they would like to address in the future, 11 participants answered rather no and 8 participants answered rather yes. The last question of this set of questions was whether participants think that managers of SMEs would support their employees if they choose to pursue a degree program towards digitalisation and half of the respondents answered rather yes, 6 rather no, and 5 yes. The results of the part of the questionnaire related to the assessment of readiness for digitalisation are presented in Figure 13.
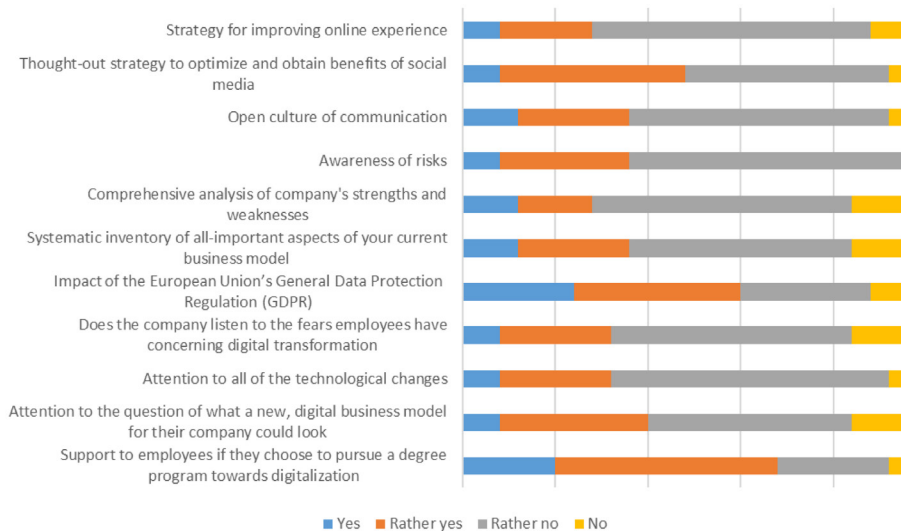
Figure 13. Assessment of the readiness for digitalisation
Source: Own research

4. CONCLUSION

Recent scientific research shows that the annual scientific production in this domain grows by 80.53% and has seen a sharp rise since 2016 (Bin, Hui, Qifeng, Ke 2021). Furthermore, recent studies estimate that the digitalization of products and services can add more than 110 billion Euro of annual revenue in Europe in the next five years.

In 2020, only 1% of EU enterprises with at least 10 persons employed reached a very high level of digital intensity while 14% reached a high level. The majority of the enterprises recorded low (46%) or very low (39%) levels. Compared to 2018, the Digital Intensity Index (DII) has seen a general improvement at the EU level, with increases at both very high (+5.0 percentage points (pp)) and high (+0.4 pp) levels. Eurostat data show that 9% of the EU's large enterprises had a very high DII and 42% a high level, while only 2% of medium-sized companies registered a very high-intensity level and one-quarter (25%) a high DII. Only 0.4% of small enterprises reached a very high digital intensity, with only 12% scoring a high DII.

According to one of the targets of the EU's vision for digital transformation, at least 90% of the EU's small and medium-sized enterprises (SMEs) should reach a basic level of digital intensity by 2030. The basic level entails the use of at least four technologies and includes enterprises with low, high and very high DII. In 2020, three out of five SMEs (60%) in the EU reached at least a basic level of digital intensity, against 89% of large enterprises.

The goal of our survey is to develop and implement an innovative training programme for SMEs regarding 4.0 technologies. The first step of the development of the programme was market research that was conducted in the form of questionnaires. Questionnaire was completed by 30 participants from different sectors, different roles in organisations and different lengths of professional experience. The results of the questionnaire showed that most of the participants are familiar with 4.0 technologies and find it important. The most important technologies are robotics, 3D printing and Cloud Services, big data, and IoT, while Blockchain and artificial intelligence are considered less important for digital transformation. The main barriers to the implementation of 4.0 technologies are lack of skills and knowledge among staff and the cost of technologies.

Readiness for digitalisation process, that includes the existence of thought-out strategy for improving the online experience of customers, culture of communication, awareness of risks, carrying out a comprehensive analysis of company's strengths and weaknesses, systematic inventory of all-important aspects of current business model, experience with methods of analysis, impact of GDPR, reaction of the company to the fears of employees, as well as the being able to present ideas, preparation for future challenges and preparation for implementation of new business model, is at quite high level. Also, the fact that most of the SMEs have an expert for digitalisation also supports that they are ready for digital transformation.

The results of the questionnaires show that 4.0 technologies and related skills are already important and will become of even greater importance. However, SMEs are still not completely ready for digital transformation and there a strong need for further education and training in all of these areas was expressed. The analysis of the questionnaire showed that 4.0 technology skills are still not quite present in the educational system.

The conclusion of the analysis of current skills, knowledge and qualifications regarding digitalisation is that the new and innovative programme regarding 4.0 technologies is necessary in order to use all of the advantages of digital transition, such as cost reduction and improved efficiency. This analysis showed that it is important to include 4.0 technologies in education and training to ensure having an educated and qualified workforce.

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Building Information Modelling (BIM) and Engineering Evolution in a Digital World

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Abstract: *Building Information Modelling (BIM) is the foundation of digital transformation in the architecture, engineering, and construction (AEC) industry. This is an instrument helping professionals and students to gain an understanding of technologies that will be crucial to the future industry. In addition, BIM is a tool that improves the efficiency and integration of building designs by integrating architectural knowledge with technical processes. Contractors, architects, and engineers are increasingly utilising virtual technology for long-distance communication. According to Reuters, the worldwide BIM industry is anticipated to grow at a CAGR of 14.9 percent from 2018 to 2023. Government mandates for the development and implementation of BIM to improve project efficiency and reduce operations costs are the driving force behind it. BIM was portrayed in specialised literature as a component of the solution for an industry beset by cost and schedule overruns, enabling owners and stakeholders to make knowledgeable decisions based on the real-time information the digital models provide.*

1. INTRODUCTION

Building Information Modelling (BIM) as Gaikwad, Rake and Kumar (2020, p. 103) mention is an intelligent 3D model-based process, which provides construction professionals, architecture, and engineers to efficiently design, manage, construct and plan the infrastructure of the buildings. BIM can be thought of as a virtual process that integrates all aspects, disciplines, and systems of a facility into a single, virtual model, allowing all members of the design team (owners, architects, engineers, contractors, subcontractors, and suppliers) to work together more precisely and quickly than they could with conventional methods. To make sure the model is as precise as possible before the project actually starts; team members are constantly modifying and revising their portions in accordance with project specifications and design modifications.

BIM is not just software; it is a process and software. By using BIM, you may significantly alter how projects are delivered and the workflow. BIM is a new paradigm in AEC that promotes the integration of the roles of all project stakeholders. It could encourage more cooperation and efficiency between players who previously considered each other as rivals. Integrated project delivery is a revolutionary project delivery approach that integrates people, systems, and business structures and practices into a collaborative process to minimize waste and maximize efficiency, and it is supported by BIM as well.

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The following applications for a building information model are possible: 3D renderings for visualisation; fabrication/shop drawings: It is simple to create shop drawings for different building systems. For instance, once the model is finished, sheet metal ductwork shop drawings can be easily created; code reviews: These models may be used by fire departments and other authorities to examine construction projects; cost estimation: BIM software has capabilities for cost estimation; Coordinate the ordering, fabrication, and delivery schedules for all building components during construction. All significant systems may instantaneously and automatically be checked for conflicts, interferences, and collisions. Forensic analysis: Using a building information model, facilities management can graphically display probable breakdowns, leaks, and evacuation strategies.

2. METHODS

Construction, engineering, and architecture (AEC) are sectors of the economy that are entering a new industrial era. Digitization of the AEC sector is one of Industry 4.0's primary goals. Building information modelling, which develops a digital database of data on a building object, is a step in this direction. As Nechyporchuk et al. (2020) stated the level of BIM awareness is crucial at the higher education stage because it is one of the primary trends in the growth of construction today. To significantly increase building efficiency, this new approach calls for new mentalities and technical proficiency. Universities must concentrate as Sampaio (2015, p. 302-315) emphasises on the strategy of utilising BIM as an innovative technology to enable students to pick up new abilities and get ready for their future work in a cutthroat environment.

According to each organisation' size and position in the value chain, BIM adoption and sophistication varies greatly from nation to country and from company to company, changing existing processes and fostering increased collaboration, including data sharing (Figure 1). BIM is currently standard practice for some large engineering firms, but the majority of small businesses in the value chain lack BIM expertise. In truth, BIM has never been employed on any of the big contractors' projects. The adoption rates in Europe vary significantly according to the World Economic Forum (2016); for instance, only 16% of E&C companies in the UK have ever used BIM, compared to 49% in Austria. "Big and open" BIM, which combines the entire value chain and is defined by full software compatibility and open access to it, is what the industry needs. The technical obstacles are probably going to be resolved in the near future as Poljanšek (2018, p. 5) estimates, but it might be harder to alter current procedures and foster greater collaboration, including data sharing.

Heesom et al. (2020) developed a systematic collaborative heritage building information modelling (HBIM) to integrate tangible and intangible cultural heritage. Based on two innovations, Dore and Murphy (2014) developed a novel semi-automatic method for producing accurate BIM facade models for as-is buildings from laser and picture data. Building Energy Performance Simulation (BEPS) models were created by O'Donnell et al. (2019) by converting point clouds from a laser scanner into a building's outside façade geometry as input data. Semantic enrichment was then manually completed. In order to produce geometric shapes in a BIM-compatible format, Laefer and Truong-Hong (2017, p. 66-77) suggested a method to automatically identify steel structure components from terrestrial laser scan point clouds. To choose the appropriate cross-sectional forms and sizes, they used kernel density estimation. An approach related to measured metrics was introduced, determining the best match of diverse cross-sections from a pre-filled library.
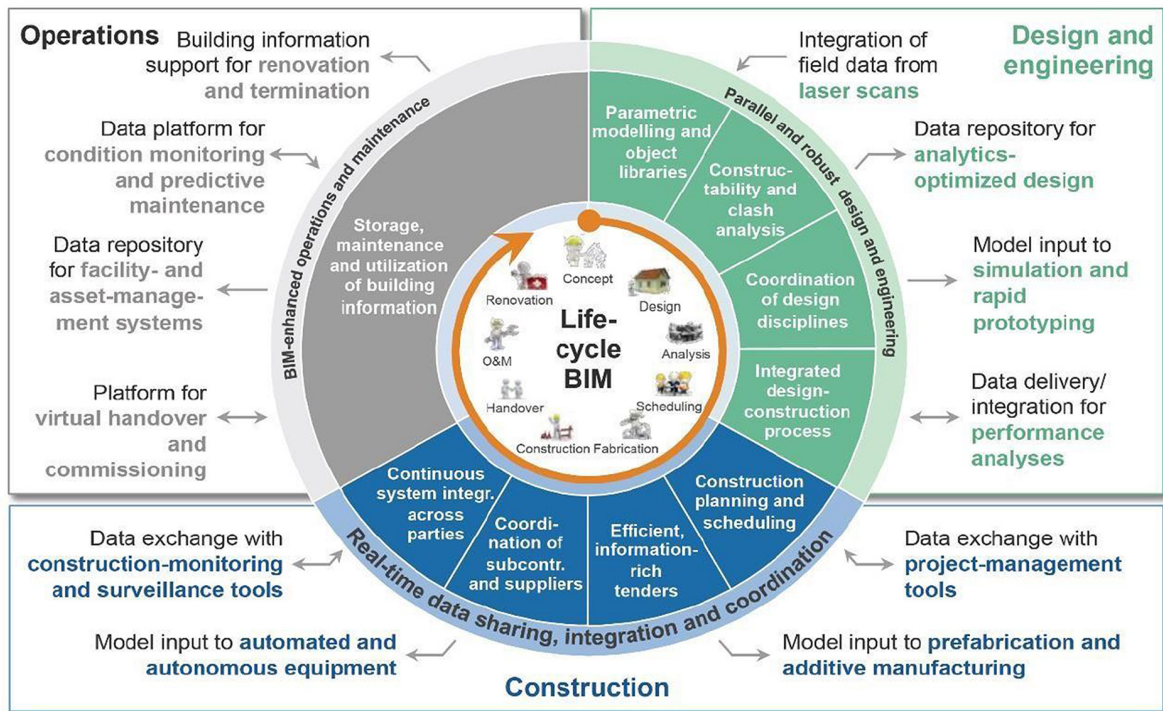
Figure 1. Applications of BIM along the engineering and construction value chain
Source: Shaping the Future of Construction

Wei and Akinci (2019) proposed a vision and learning-based framework using a shared convolutional neural network to perform localization and semantic segmentation simultaneously. Using point cloud data gathered by laser scanners, Xiong et al. (2013) suggested a method for creating 3D information models of structural components in an indoor environment. In order to create a systematic, accurate, and practical digital twinning system based on photos and CAD drawings, Lu et al. (2020) created a semiautomatic framework. Infrastructure experts Lu and Brilakis (2019) proposed a slicing-based object fitting method that can generate the geometric DT of an existing reinforced concrete bridge efficiently and accurately from four types of labelled point clusters. By using the highly regulated and standardised character of railroads, Ariyachandra and Brilakis (2020) demonstrated a method to identify railway masts using airborne LiDAR data. The coordinates of the mast placements, point clusters that were found, and 3D models of the IFC format masts are the method's final outputs.

Jiang et al. (2021) with the help of Terrestrial Laser Scanning (TLS) data (p.4), and Cheng et al. (2019) suggested a method to automatically classify component types (rails, cross-sections, pipelines, catenary equipment, and refuges) and construct parametric as-is BIMs for single-track railway tunnels. Therefore, as we plan, design, and build the railway, it is essential to have an integrated "virtual" or "digital model" of the project information and all the railway assets visualised as three-dimensional (3D) designs in the environment in which they will be built. We must also interrogate data, test hypotheses, and validate decisions with our stakeholders. Using practical methods, architects and engineers can evaluate a design's performance before it is created and maximize an asset's performance over the course of its whole life. Drone imaging augmented and virtual reality, internet of things sensors, improved building materials, artificial intelligence, and machine learning are all included in the field of digital engineering. Together with BIM, these technologies help a digital twin reflect the real-time characteristics of its physical counterpart.

3. RESULTS

Complex architectural works, modern construction techniques, and the management of the entire construction site are inconceivable without modern technical solutions stated Vasić et al. (2021, p. 1). One of the technologies that emerged in project management and construction is BIM. BIM is similar to the idea of PLM (Product Lifecycle Management) because it deals with cost management, project management, and concurrent work on various elements of an item used in addition to an object's physical qualities according to Sabadoš et al. (2016, p. 149-161). The majority of contemporary businesses use BIM to plan and organise three-dimensional projects. Many construction-related problems and conundrums are effectively resolved with the use of 3D models and their inspection. The use of BIM has several advantages, from project management to mistake detection to the visual identity of the building itself. As Vasić et al. mention (2020) this might also avoid issues while the building is being done.

BIM is a collaborative work approach that aims to link individuals, systems, and digital models in construction and infrastructure projects as stated by Freire et al. (2002, p. 248) to facilitate information and communication flow. As a result, it is hoped to manage the design, construction, and administration phases of the project using a digital graphic representation of its physical attributes and functionality throughout its lifecycle, taking into account relevant data that goes along with the graphic representation and enabling its use for a variety of purposes as Vitiello et al. (2019, p. 90) state. Early on in the project, there is a critical demand for BIM according to Zuppa et al. (2009, p. 503). In particular, it has been shown that BIM makes it easier for professionals from other disciplines to communicate and share information during the structural design process, as Eastman et al. (2010, p. 25) underline enabling increased accessibility and regular updating of information, even in real-time. BIM improves knowledge management, which decreases according to Ho et al. (2013) the time and expense of resolving issues with constructability and project coordination. In addition, it allows architects and structural engineers (bidirectional flow) to visualise modifications and conflicts and assists immediate decision-making, significantly reducing rework and optimising project times and costs. Also, by detecting errors in advance and automating variables that were traditionally used in "manual" processes, Harrington et al. (2010, p. 1645) appreciate that BIM enhances the automation of detail engineering and documentation processes, reducing work times and increasing project quality (according to Pezeshki et al., 2016, p. 273). The possibility of integrating structural and non-structural elements into the model controls the performance of the whole is underlined by Muñoz-La Rivera et al. (2019, p.3).

The quality, repeatability, and level of excellence within a BIM capacity also need to be acknowledged as part of the definition of BIM maturity as Liu et al. (2016, p.273) underlined. In other words, it serves as a gauge for BIM adoption within a company. The Bew-Richards model according to Bew et al. (2008) and the Succar model as Succar (2009) presented it are two scales that are widely used to assess BIM Maturity. Succar model uses more specific descriptors than the Bew-Richards model does, both models employ them to indicate where one Level ends and another begins. Traditional building delivery systems, which use paper-based mediums for all papers and technical drawings, are what define Level 0 (also known as Pre-BIM). Level 1 denotes object-based modelling, where 2D or 3D digital objects represent structural components. Model-based collaboration between various stakeholders participating in a construction project happens at Level 2. As the intermediate step before integrated project delivery, Level 3 denotes, as Sinoh (2020, p.5) emphasizes network-based integration and is the long-term goal of BIM deployment. Figure 2 shows the Bew-Richards BIM Maturity model.
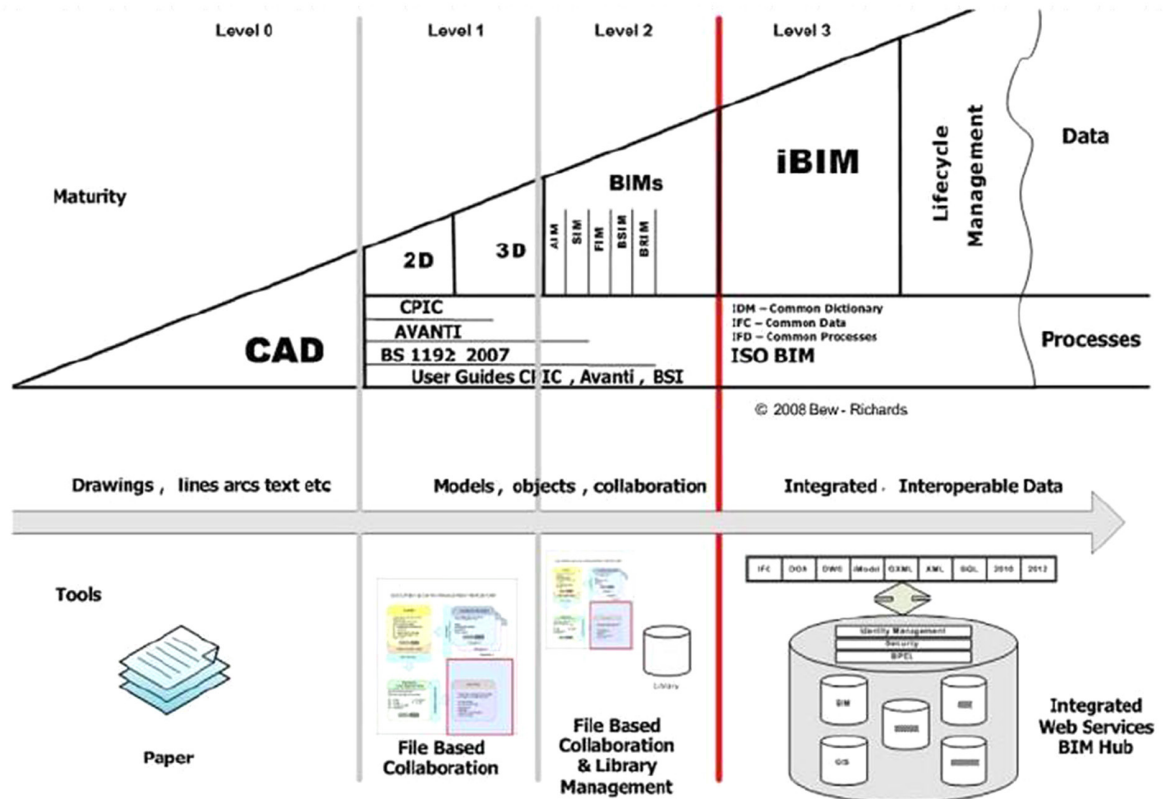
Figure 2. Bew-Richards model for BIM Maturity
Source: Bew et al. (2008)

BIM maturity is associated with the fact that it is not possible to move from a traditional modelling approach toward an open BIM approach. The change, according to Poljanšek (2017, p. 4) has to be managed progressively as climbing up a stair step by step.
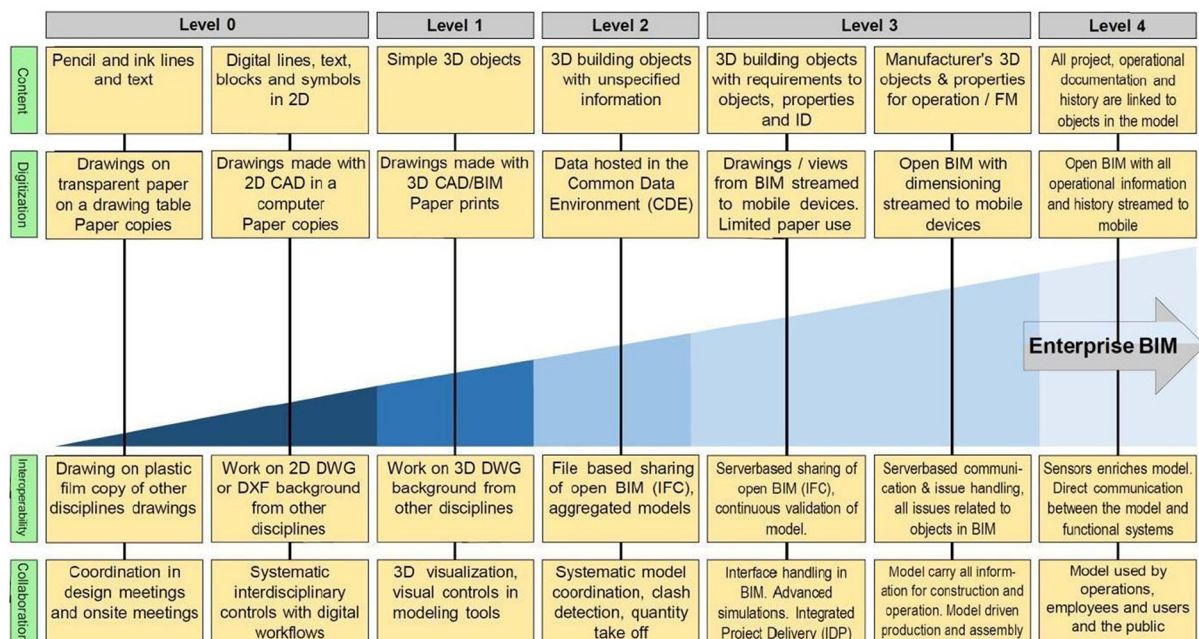
Figure 3. BIM Maturity Levels
Source: Adapted from Martin Poljanšek, JRC Science Hub, https://ec.europa.eu/jrc, JRC Technical Reports, Building Information Modelling, (BIM) standardisation

4. DISCUSSION

The correct exchange, quality information extraction and storage, are relevant to the success of BIM. There, according to Xu et al. (2018, p. 5) the importance of universal archives, such as IFC format, is relevant to the achievement of these objectives. Despite the aforementioned lack of consensus, approaches or recommendations for the adoption of BIM exist, primarily from industrialized nations like the United States, Holland, and the United Kingdom, among others.

These lists, as mentioned by the BIM Committee (2015, p. 5) of IM guidelines are organized around project development, roles played, and the duties, goals, and responsibilities assigned to each participant, according to Penn State University (2011, p. 4). The procedures for putting BIM into practice in businesses-plans, training, studies, gradual modifications, etc. remain to be established. It is critical to make it clear that the introduction of BIM does not change design standards or criteria; rather, it restructures how experts and processes grow and collaborate. As a result, each team member understands the significance and goals of the process, has clearly defined roles and responsibilities, and learns the necessary skills, competencies, processes, and interactions for a project to be successful as Muñoz-La Rivera et al. (2019. p.4) stated. The implementation plan also acts as a manual for new experts joining the project at hand and a source for assessments of the project's success in the future as Smith stated (2014, p. 484).

Succar and Sher (2014, p.4) have analysed the way in which organisational and educational institutions have started to adapt their delivery systems to meet changing demands on the market. One of the first articles to use taxonomies and conceptual models to explain how to categorise, filter, and aggregate individual responsibilities into a database of competencies. It also covered the advantages the competency-based approach has for both business and academics. Individual BIM skills, as defined by the authors, are the character qualities, technical talents, and professional skills needed by an individual to successfully complete a BIM activity or to produce a BIM-related output. These abilities, outcomes, or processes could be evaluated against performance standards and acquired through development, training, and education.

Wu and Issa (2014, p. 849) recommend preparation as a means of enhancing BIM curves while noting that young graduates' credentials fall short of what is required for industry positions. Instead, they suggest that BIM education should prepare graduates to the point where their BIM skills can be shaped by organizations in accordance with their particular requirements. The expertise of BIM for managing buildings is emphasised by Meziane and Rezgui and Antons et al (2020). They also highlight how a team leader with excellent BIM abilities may significantly influence project success and teamwork. The construction sector appreciates finding prospective employees that not only have BIM technology experience but also have a wide range of analytical skills. The main goals of other social media mining algorithms that have been studied by various researchers, including Lopez-Castroman et al. and Song et al. (2019) are crime predicting and alarm systems as well as suicide prevention. We can see that there is room for improvement in the BIM business, notably in relation to BIM jobs and skills, and that there is a gap in the current literature, reflected by a lack of usage of social media mining. Nevertheless, we could find numerous attempts to use the BIM industry field as an application for social media mining, such as the one of Zhang and Ashuri which attempted to mine the BIM design logs to discover connections between social network features and the production success of designers. Additionally, Kassem et al. attempted to identify the key competencies of the BIM expert positions which are selected on the basis of their quotes and the review of their skills overlap, as also Hodorog et al. (2020, p. 1216) mentioned.

5. CONCLUSION

Building Information Modelling (BIM) is an intelligent 3D model-based process, which provides construction professionals, architects, and engineers to efficiently design, manage, construct and plan the infrastructure of the buildings. BIM can be thought of as a virtual process that integrates all aspects, disciplines, and systems of a facility into a single, virtual model, allowing all members of the design team (owners, architects, engineers, contractors, subcontractors, and suppliers) to work together more precisely and quickly than they could with conventional methods. Without a current technological solution, it would be impossible to handle modern building methods, complex architectural works, and the complete construction site. BIM is comparable to the idea of PLM (Product Lifecycle Management) because it deals with cost management, project management, and concurrent work on various elements of the item used in addition to an object's physical qualities.

The majority of contemporary businesses use BIM to plan and organize three-dimensional projects. Many construction-related problems and conundrums are effectively resolved with the use of 3D models and their inspection. The use of BIM has several advantages, from project management to mistake detection to the visual identity of the building itself. This might also avoid issues while the building is being done. BIM improves knowledge management and sharing, which cuts down on the time and money needed to address issues with constructability and project coordination. Additionally, it facilitates quick decision-making, reduces rework significantly, and optimizes project times and costs by enabling architects and structural engineers (bidirectional flow) to view alterations and conflicts. Additionally, BIM improves the automation of detail engineering and documentation procedures, cutting down on work hours and improving project quality by spotting problems beforehand and automating variables that were previously employed in "manual" operations. The ability to incorporate both structural and non-structural components into the model governs how well it performs as a whole.

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The Specific Interrelation between Motivation, Emotions and Sustainable Consumer Behaviour

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Abstract: *The changes brought about by COVID-19 and digitalisation do not eradicate the genuine problems associated with sustainable consumer behaviour and achieving sustainable development in general. Consumer motivation and emotions are closely intertwined with achieving sustainable consumer behaviour. The research interest was sparked by the interrelation between motivation, emotions and sustainable consumer behaviour. It is specific and determines the extent to which consumers want and are motivated to consume sustainably and in parallel with what emotions they experience in the overall consumer decision-making process and their consumer journey. The research methodology includes presenting the relationship between the individual elements in the purchase, presenting different types of motivation that affect sustainable consumer behaviour, clarifying the different types of emotions in sustainable consumer behaviour and focusing on happiness as a leading emotion to achieve sustainable consumption. It is to the benefit of the readers to recognise the importance of the interrelation between emotions, motivation and sustainable consumer behaviour and build perfect strategies based on it.*

1. INTRODUCTION

Overall, achieving sustainability is influenced by many public actors, including government agencies, private companies, NGOs, local communities, etc. Individual actors can be formal or informative, but both sides are crucial to sustainability. Formal institutions offer significant potential for immediate reforms because, in reality, a number of political processes have been taking place in them. In contrast, various political instruments appear in informal institutions that directly influence human behaviour, including taxes, regulations, fines, educational programs, public disclosure, or threats of imprisonment (Dovers, S. 2005).

An essential positive direction in the creation and development of sustainability is the institutional reform at the state level which will actually provide significant benefits for achieving this sustainability, as there is significant juridical supremacy at this level. The introduction of environmental policy in companies and at national level is the core for achieving this sustainability (Lafferty W. and Hovden E., 2003).

Environmental issues are closely linked to other economic sectors such as finance, trade, energy, transport and urban development, where primary reporting is not linked to environmental performance. It is in these sectors that a number of measures need to be taken to ensure overall sustainability.

Following the UN Conference on environment and development in Rio de Janeiro in 1992, measures have been taken for the complete transformation of people's attitudes and, hence, their behaviour to ensure the necessary changes. In reality, the conference proved to be the turning

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point in the discussion of environmental and developmental issues as significant ones in the public space. Through the use of various mechanisms, sustainability considerations can become a core business in a number of policy sectors.

Next, systemic policy instruments and actions taken can address the causes rather than the symptoms of not using certain unacceptable behaviours. System tools include market mechanisms and environmental budget review. At the same time, there has to be a redistribution of natural resources, which requires changes in the legal framework (Connor and Dovers 2004).

Although there are many opportunities for change at national level, there are many other public actors that play a key role in achieving sustainability (Sassen 2006). For example, institutional reform can be difficult in countries where corruption is widespread and where formal institutions are weak, and strong decisions are made by other bodies. In these situations, civil society plays a particularly important role.

It is especially important to achieve sustainable development, as a basis, by changing the thinking and behaviour of consumers and transforming it into a sustainable one. The behaviour of consumers during the entire purchase process contains the following basic elements: activation, emotions, motivation, attitude, involvement, shared values and lifestyle, satisfaction and loyalty.
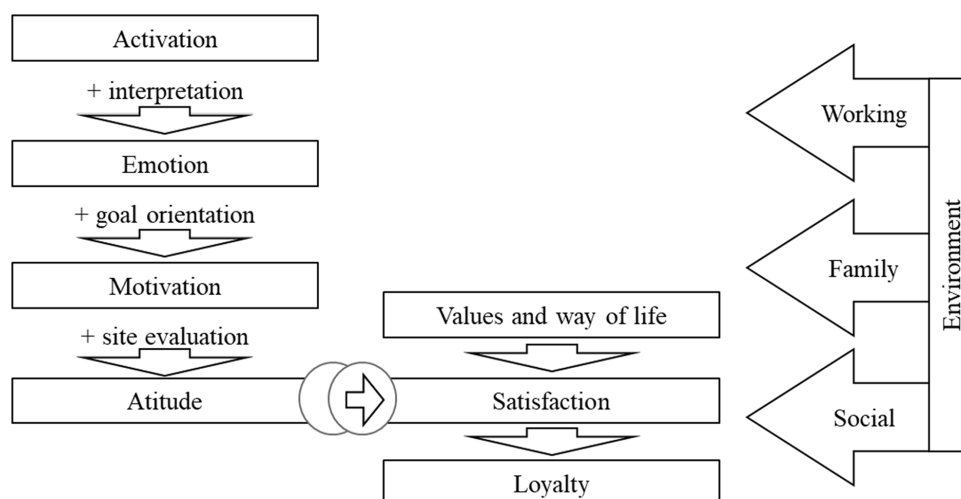
Figure 1. Relationship between the individual elements in the purchase
Source: Krastevich, 2018.

This study focuses on two of the main elements, i.e. emotion and motivation, which, in our opinion, are highly structural and interrelated with sustainable consumption. Taking historical perspective, we turn to the Theory of Evolutionary Life, which explains that when consumers are confident that they will have enough resources available in the future, they tend to be less impulsive about food consumption and other resources (Griskevicius *et al.* 2012). The difference lies in the temporal orientation or abundance and at present can indeed lead to increased consumption due to the cognitive belief that resources are abundant. The main thing is realistically achievable, the prospect of future abundance to be implied by sustainable production, which in turn activates consumer behaviour aimed at prosocial behaviour (Farmer *et al.*, 2017)

On the other hand, motivation itself is a rather complex task. Large companies quite skilfully combine different marketing approaches to motivate consumers to buy their products.

According to Temelkova (2018), human motivation is a dynamic process that is influenced by changes in the environment, changes in public attitudes and public opinion, which is strongly related to the level of knowledge and experience, social status, age and economic and political factors. She claims there is motivation even when choosing a tourist destination. Motivation is a dynamic process that changes on the basis of the level of awareness achieved through the media and different presentation of destinations and tourist sites of cultural and historical heritage. In a more general context, there are three motivating goal frames in the scientific literature embedded in Locke's Goal-Setting Theory of Motivation that influence sustainable consumer behaviour (Lindenberg & Steg, 2007), namely - gain, hedonic and normative.

1.1. Gain Goals

In their conceptual arguments, Linderberg and Steg (2017) define gain goals as preserving and improving the use of resources. The authors emphasise the view that they force people to be more aware of their personal resources. They are medium to long-term, through which consumers seek to increase efficiency or reduce their financial costs.

1.2. Hedonic Goals

The conceptual arguments of the Goal-Setting Theory of Motivation define hedonic goals as the main tool to make people enjoy themselves or feel better right now (Lindenberg & Steg, 2007). These goals are related to people's self-confidence, excitement and pleasure, as well as express an attempt to avoid different types of effort. Recent studies of resilience have shown that positive emotions have a positive effect on intentions (Rezvani et al., 2018; Khan & Irfan, 2019). Miao and Wei (2013) also claim that hedonic goals are a prerequisite for sustainable consumption. The proposed concept is related to human feelings and when the feelings are positive, the intentions to buy such products are positive and vice versa.

1.3. Normative Goals

The third motivating goal frame used for the purposes of this study is normative goals. Linderberg and Steg (2017) define normative goals as the basis for acting appropriately. In their view, the Goal-Setting Theory of Motivation borrows this concept from the well-known Norm Activation Model (NAM) (Schwartz, 1977).

Initially, the concept was applied to general categories, but later it was successfully applied to sustainable research (Thøgersen, 1999). The emphasis in the model is that when people are aware of the negative consequences for the environment, their personal and moral norms are activated. Personal norms are related to an individual, while moral norms are related to society as a whole.

In various scientific studies, the direct and indirect link between normative goal frame and consumer intentions is tested and proved that it has a positive and strong role in influencing consumer behaviour (Rezvani et al., 2018; Khan & Hameed, 2019).

The other emphasis in our development are the emotions, which, in addition to being closely related to motivation, are also structurally determining for sustainable consumer behaviour.
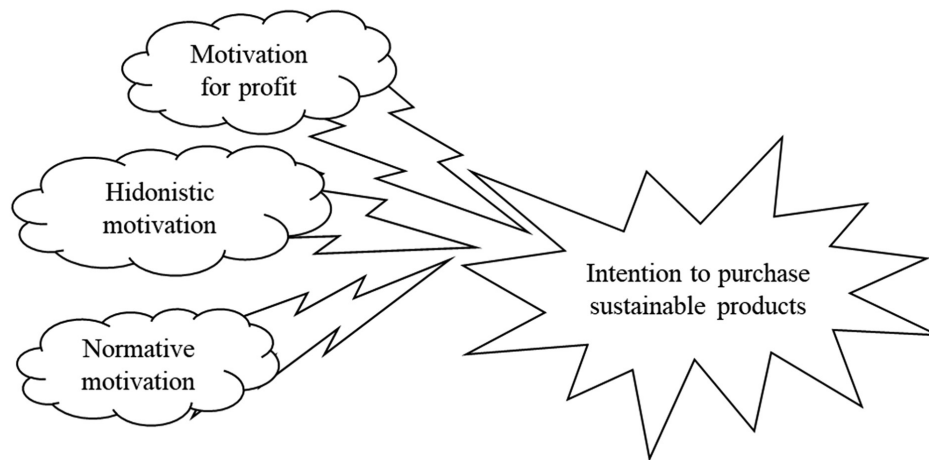
Figure 2. Relationship between the motivating goal frames and the intention
to purchase sustainable products
Source: Khan & Hameed, 2019.

The dynamics of the science of shopping poses a new challenge to marketers - the time consumers spend in stores depends on how comfortable and fun it is to experience in them, that is, the emotions that will be evoked in them.

At the heart of the science of shopping is the paradigm that there are certain anatomical features, limitations, needs, desires and trends that are common to all consumers and which managers should take into account in the construction and operation of retail.

According to Nakova (2020), consumer loyalty is especially important. According to her, there is still no consensus on the term loyal customers, although most researchers have agreed that the loyal customer is the one who has made more than one purchase from a brand. Another problem is the way of measuring loyal consumers, and in the scientific community there are two common ways of measuring: through consumer behaviour and consumer attitude (Nakova, R., 2020).

On the other hand, some people question the ethics of manipulating consumers through their emotions. If emotions are used to persuade customers to buy, we could conclude that this is unethical. However, when quality and reasonably priced products are offered, it is not unethical to use consumers' emotions to buy the product and the situation is different. We must not forget that as human beings we have emotions and everything we do has an emotional component.

Truly great marketers need to know the emotions of consumers. They learn to work in sync with the needs and emotions of consumers and, at the same time, to "turn on" or "turn off" those emotions. This is the most profitable art formula in the field of marketing and will always be. In practice, there are a number of examples of advertisements and commercial messages that are professional, credible and reliable, and at the same time illustrate the incredible power of emotional marketing (Dimova, 2013).

Emotions are specific and especially strong when there is sustainable consumer behaviour. They are important components of consumer response that affect their judgments, evaluations and decisions. They are accepted as causes, effects, mediators and moderators of consumer behaviour (Williams, 2013; Bagozzi *et al*, 1999).

The classic view of the types of emotions is that they are innate and acquired. There are six basic emotions innate: joy, sadness, anger, fear, happiness, wonder and disgust. The second large group are acquired emotions, which are numerous, such as jealousy, guilt, shame, horror of seeing suffering, pleasure of seeing justice, aesthetic pleasure of poetry and music, religious empathy, wounded pride, harmony in scientific knowledge and others. Another set of emotional experiences accompanying fatigue, emotions caused by a sense of well-being, etc. is defined (Piryova, 2011).

The focus of this article will be on one of the main emotions that sustainable consumer behaviour should evoke, namely happiness. According to O'Brien, happiness can be used to promote sustainable consumption. The natural desire of the individual for happiness becomes an entry point for discovering the fact that his well-being is inextricably linked with the well-being of other people and the environment. This concept can challenge the common misconception that living in a sustainable way leads to a decline in quality of life.

The concept of happiness is used in various occasions and ways. In the broadest sense, it is an emotion that is associated with all that is good. In this sense, it is often used interchangeably with terms such as 'well-being' or 'quality of life' and refers to both individual and social well-being. Synonymous with total happiness is "life satisfaction". This use of words shows that there is the ultimate good and it obscures the differences of interest between people and society. In a more limited context, happiness can be used as "subjective satisfaction with one's life as a whole" (Gregory & Rutledge, 2016).

In reality, in the context of sustainable marketing, happiness has two main components, i.e. an affective component (hedonic level of influence) and a cognitive component (satisfaction) (Veenhoven, 2009).

Sustainable happiness offers opportunities to improve the quality of life and contributes to individual community and global well-being. It represents the evolution in happiness that is needed to give the world a more sustainable trajectory. In turn, this makes sustainable happiness an indispensable concept that fits perfectly into the concept of sustainable marketing and at the same time contributes to the overall concept of modern future companies.

Niyazieva claims that "sustainable marketing is a holistic approach in order to meet the wishes and needs of customers while giving equal importance and emphasis to environmental and social issues, thus generating profit for the organization in a responsible way".

At the national level in the Republic of Bulgaria, the goals of sustainable development emphasise achieving positive emotions, motivation and satisfaction as well as ensuring that by 2030 all people are to have access to relevant information and have their awareness raised on the issue of sustainable development and lifestyles in harmony with nature (https://nsi.bg/bg).

A more general point of view is presented by Nikolova (2020), who claims that among the priorities for the country's development are the ones that meet the European priority and promote economic development, namely maintaining sustainability in the regulatory framework in terms of amending the normative acts and regulations. The lack of transparency and especially the frequent and unjustified change of basic laws and regulations lead to increased levels of political risk and change in the business climate for economic entities in the micro economy. In

addition, when a normative act is changed for a specific person or company, a precondition is created for a further change, especially when it is not justified (Nikolova, 2020).

The interrelation between motivation and emotions leading to sustainable consumer behaviour is a strategic and important step in building an excellent sustainable marketing strategy. The role of company leadership, even now, is based on the creation and development of overall sustainable development that meets all social, economic and political rules and laws.

2. CONCLUSION

In conclusion, achieving a specific interrelation between motivation, emotions and sustainable consumer behaviour depends largely on the genuine desire and ability of companies to redirect their resources and reshape their marketing strategies in accordance with the changes taking place which are both environmental and digital challenges. The real achievement of sustainable consumer behaviour will inevitably lead to the achievement of overall sustainable development and preservation of the good life of future generations. Only the future will show whether the actions the companies have been taking are adequate and appropriate to achieve not only survival but also a basis for the development of all stakeholders.

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Sports-Related Nutrition Marketing and Its Performance Impact on Athletes in the Republic of North Macedonia

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Abstract: *Nutrition is increasingly recognized as a key component of optimal sporting performance, with both the science and practice of sports nutrition developing rapidly. The sports nutrition market has witnessed robust growth in the past few years; it is gaining pace due to the increase in health awareness among the population, new product development, the rapid increase in urbanization, and growth in a number of sales outlets, health clubs, fitness centers and gyms. Athletes use a range of nutritional and diet strategies to improve sports performance. Nutrition plans need to be personalized to the individual athlete to take into account the specificity and uniqueness of the event, performance goals, practical challenges, food preferences, and responses to various strategies. A key factor is the related marketing used to reach the core aim of the athletes for specific sports nutrition so they can meet their energy and nutrient requirements, whether that is speed, endurance, recovery, or strength. The marketing strategies in the sports nutrition industry are wide. Companies understand the power of sports endorsement, the trending on social media, and after all the factors of advertisement, through the different marketing communication channels impacting the athletes' behavior for the final decision-making process of purchasing the product. In this paper the purpose is to investigate the effect of sport-related nutritional marketing as a communication strategy reaching athletes, and, its second relationship, the effect of the marketed sport-related nutritional products impact on athlete's performance, from the athlete's aspect. The importance of this paper is to examine a new topic of a connection between sports nutritional marketing and the eventual performance effect on a particular sub-category of athletes because very little research is being conducted on this topic of interest. The research framework used in this paper will help to guide future research and improve marketing communication strategies with great insight on what are the key methods to reach out to short and distance athletes from a marketing point of view, as well as the key factors that make marketed sport nutritional products impact on athlete's performance.*

1. INTRODUCTION

Nutrition is increasingly recognized as a key component of optimal sporting performance, with both the science and practice of sports nutrition developing rapidly, explains Beck et. al., (2013). Every time we eat we have an opportunity to nourish our bodies. The sports nutrition market is gaining pace due to the increase in health awareness among the population, new product development, the rapid increase in urbanization, and growth in a number of sales outlets, health clubs, fitness centers and gyms. Beck et al. (2013) define the "Athlete" as individuals competing in a range of sport types, such as strength and power (e.g., weightlifting), team (e.g., football), and endurance (e.g., marathon running). Athletes and active people should choose nutrient-dense foods as often as possible to support their bodies' increased nutrient requirements. Athletes often expend more energy and therefore have higher energy requirements, so they may

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need to consume more serves of each of the food groups to meet their energy and nutrient requirements, it is concluded in the research developed by Food Standards Australia New Zealand (2010). Nutrition is determinant in achieving adequate sports performance, which is defined by three variables: training, rest, and feeding. The sports nutrition market in Europe is expected to grow by USD 2.01 billion from 2021 to 2026, progressing at a CAGR of 8.01% as per the latest market report by Technavio (2022).

2. SPORTS-RELATED NUTRITION MARKETING COMMUNICATION STRATEGIES

According to Kotler & Armstrong (2011, p. 12), "the company's marketing strategy outlines which customers it will serve and how it will create value for these customers. Companies need to do well in their marketing strategies. The marketing program builds customer relationships by transforming the marketing strategy into action. It consists of the firm's marketing mix, the set of marketing tools the firm uses to implement its marketing strategy".

Sports nutrition products supply carbohydrates, proteins, minerals and fluids. Examples are sports drinks and sports bars. Ergogenic supplements claim to enhance performances in one way or another. Examples are caffeine, creatine and ginseng according to The Norwegian Directorate of Health (2005). Corresponding to Titchenal (2001), based on product type, the sports nutrition market can be categorized into sports food, sports drink and sports supplements. The sports nutrition segment includes energy drinks, powders, liquid meal replacements, energy bars, creatine supplements and the like. These products are marketed as supplements before, during and after physical exercise. This delimitation is central because the market for food supplements, of which sports nutrition products are only a small subcategory, is enormous, stresses Ånestad (2009). Sports nutrition products are offered in all shapes and sizes; such as ready-made drinks, bars, tablets, capsules, gel form and powder that can be mixed with milk as well as water. There are products suggested for gaining muscles and weight, while other products promise to help you control your weight. Products aimed at training and competition promise to increase achievements by giving prolonged endurance, others may help with recovery of the body after training, explains Bjerck et al. (2009). They also state that there are many different sales channels for sports nutrition products. While some products are sold through grocery stores and in health food stores, others can only be bought in special stores for sports nutrition products and on various Internet sites. Internet is the central point of marketing strategy in the sports nutrition industry, it has become a new way to create value and build a relationship with the customers (Kotler, 2014), however, some physical placements and stores are making a change in the market.

Sports stores - sell items related to various forms of sports and exercise, among them are sports nutrition products. Sports stores are one of the most important sales channels for sports nutrition products (The Norwegian Directorate of Health 2005).

Healthy food stores - in general, are meant to provide healthy food supplements and ingredients and offer a wide range of sports nutrition products (The Norwegian Directorate of Health 2005).

Gyms – the focus on sports nutrition products is evident in the physical appearance of the gym; they sell different forms of sport nutrition products, starting with "sports water", protein shakes, protein drinks, energy drinks, protein bars and energy bars (The Norwegian Directorate of Health 2005).

Internet sites – starting from small startups, up to larger companies including different health food stores, sports stores and gyms, in addition to private customers are present where usually information about the nutritional value of the product along with recommendations on usage is provided (The Norwegian Directorate of Health 2005).

Social media discount - another type of promotion made on the Internet is the online sales promotion which consists in doing a discount on the website [or the social platform account] and causing a desire which leads to the purchase, says Kotler (1999). These promotions are a consequence of the proportion of people buying their food supplements on the Internet (4 out of 5 people). As said, sport nutrition companies understand the importance of the Internet and want to maximize their profits on this support by using all the different online tools they have at their disposal.

Sports events - Companies selling sports nutrition products tend to be highly visible at sports events. For them, as for many other sports nutrition companies, the importance of sports events is not to sell directly to consumers, but to present the company and its products (The Norwegian Directorate of Health 2005).

Advertisement via influencers: An influencer, is an individual who influences an exceptionally large number of their peers, and forms standards of orientation, says Watts et al. (2007). Instagram has established itself as the most important social network for influencers as it enables the most effective interaction with their network and is the best channel for paid collaboration, writes Hashoff (2017). Research conducted by Pilgrim et al. (2019) ranked the accounts that publish posts in German according to the total number of followers, excluding brand and company profiles. For the sample definition, relevant accounts communicating nutrition and exercise were identified. In order to generate a sense of the wording used on Instagram in this context, the research team examined the 100 most frequently used hashtags worldwide. The findings identify three categories of communication goals that had to be clearly distinguished from each other. On the one hand, influencers try to position themselves as experts by rhetorical means and specifically selected content. The goal is to increase the total engagement on the account. On the other hand, the majority of observed communication was intended to increase the personal appeal (of the influencer) in the eyes of the followers. The influencer consciously intended to create or increase the perceived similarity between her/him and her/his followers, as well as perceived familiarity and sympathy.

Word of mouth - As untraditional marketing and sales strategy, the sports nutrition market, in addition, is operating with recommendations, usually from traditional users of sports nutrition products. This availability increases the probability that more people encounter the products, explain Carlson et al. (2008).

3. SPORT-RELATED NUTRITIONAL MARKETED PRODUCTS AND THEIR PERFORMANCE IMPACT ON ATHLETES

The athletes' nutrition should be developed for individual athletes based on their size, sex, body composition, activity levels, individual preferences and sport-specific requirements. For example, some athletes may prefer or require more carbohydrate-rich wholegrain foods, while others require more protein-rich meat and alternatives; it is concluded in the research developed by Food Standards Australia New Zealand (2010). In sports involving strength and power, athletes

strive to gain fat-free mass via a program of muscle hypertrophy at specified times of the annual macro-cycle. Whereas some athletes aim to gain absolute size and strength per se, in other sports, in which the athlete must move their own body mass or compete within weight divisions, it is important to optimize power to weight ratios rather than absolute power, say Stellingwerff et al. (2011). Thus, some power athletes also desire to achieve low body fat levels. In sports involving weight divisions (e.g. combat sports, lightweight rowing, weightlifting), competitors typically target the lowest achievable body weight category, while maximizing their lean mass within this target. Other athletes strive to maintain a low body mass and/or body fat level for separate advantages, explain O'Connor et al. (2011). Distance runners and cyclists benefit from a low energy cost of movement and a favorable ratio of weight to surface area for heat dissipation. Team athletes can increase their speed and agility by being lean, while athletes in acrobatic sports (e.g., diving. gymnastics, dance) gain biomechanical advantages in being able to move their bodies within a smaller space. In some of these sports and others (e.g., body building), there is an element of aesthetics in determining performance outcomes. Although there are demonstrated advantages to achieving a certain body composition, athletes may feel pressure to strive to achieve unrealistically low targets of weight/body fat or to reach them in an unrealistic time frame, states Sundgot-Borgen et al. (2013). Such athletes may be susceptible to practicing extreme weight control behaviors or continuous dieting, exposing themselves to chronic periods of low energy availability and poor nutrient support in an effort to repeat previous success at a lower weight or leaner body composition. Extreme methods of weight control can be detrimental to health and performance, and disordered eating patterns have also been observed in these sports scenarios, as concluded in both research studies Sundgot-Borgen et al. (2011), (2013). Nutrition goals and requirements are not static. Athletes undertake a periodized program in which preparation for peak performance in targeted events is achieved by integrating different types of workouts in the various cycles of the training calendar. Nutrition support also needs to be periodized, taking into account the needs of daily training sessions (which can range from minor in the case of "easy" workouts to substantial in the case of high-quality sessions, e.g. high intensity, strenuous, or highly skilled workouts) and overall nutritional goals. Nutrient needs and the practical strategies for meeting them pre, during, and post-exercise depend on a variety of factors including the event (mode, intensity, duration of exercise), the environment, carryover effects from the previous exercise, appetite, and individual responses and preferences, state Thomas et al. (2016). Athletes with poor nutritional habits will not reach their full potential. Adequate nutrients are important for tissue growth and repair which is required for athletes to have full recovery between practices and competitions, stresses Beck (2015). However, the main objective of sports nutrition must be preserving the health of the athlete, which can be achieved with an adequate intake adapted to the type of training performed. Arcusa et al. (2019) point out that optimal nutrition provides the energy necessary to perform physical exercise while reducing injury rate, a factor that together makes sports performance increase by itself. Nutrition plans need to be personalized to the individual athlete to take into account the specificity and uniqueness of the event, performance goals, practical challenges, food preferences, and responses to various strategies. A key goal of training is to adapt the body to develop metabolic efficiency and flexibility while competition nutrition strategies focus on providing adequate substrate stores to meet the fuel demands of the event and support cognitive function, conclude Thomas et al. (2016).

Van Loon (2014) states that while protein consumption before and during endurance and resistance exercise has been shown to enhance rates of muscle protein synthesis, a recent review found that protein ingestion alongside carbohydrates during exercise does not improve time–trial performance when compared with the ingestion of adequate amounts of carbohydrate alone.

3.1. Fluid and Electrolytes

Evidence is emerging on the increased risk of oxidative stress with dehydration, explain Hillman et al. (2014). Sawka et al. (2007) explain that fluid consumption before exercise is recommended to ensure that the athlete is well-hydrated before commencing exercise. Especially sodium losses linked to high temperature can be substantial, and in events of long duration or hot temperatures, sodium must be replaced along with fluid to reduce the risk of hyponatremia.

3.2. Dietary Supplementation

Australian Institute of Sport in 2015 examined that performance supplements that show to enhance performance include caffeine, beetroot juice, beta-alanine (BA), creatine, and bicarbonate. Sinclair et al. (2000) state "Results of studies reported over the last five years strongly indicate that caffeine effectively increases athletic performances in endurance events". Athletes ranging from long distance runners to those participating in strength and power competitions benefit from caffeine consumption. Caffeine is a powerful ergogenic aid that may be beneficial in training and athletic performance. "It can exert its effects on both the central nervous system and the peripheral tissues, resulting in a number of physiological effects that might improve performance", says Powers (2004).

According to Murphy et al. (2014), beetroot juice is used as a supplement because of its high inorganic nitrate (NO_3^-) content, a compound found naturally in vegetables and in processed meats, where it is used as a preservative. The findings reflect the importance of supplementation with NO_3^- or nitrate salts to increase the bioavailability of NO in order to influence muscle function improving exercise performance, mainly in aerobic metabolism state Lansley et al. (2011).

β-Alanine (BA) is a non-essential amino acid synthesized in the liver, explains Matthews et al. (1987). It is also found naturally occurring in animal products such as pork, chicken or red meat, say Artioli et al. (2010). The effect of BA on performance has been attributed to its capacity to increase carnosine synthesis. Carnosine promotes the sensitivity of muscle fibers to calcium, enhancing muscle excitation-contraction, emphasizes Dutka (2014). These effects have determined that BA supplementation improves performance at exercise efforts of duration from 6 to 60s, stress Van Thienen et al. (2009).

Creatine supplementation has been shown to increase the glycogen replenishment rate, which may help those athletes who perform at prolonged submaximal effort (65–75% peak of the maximum rate of oxygen consumption − VO2max), explains Van Loon (2004). Greydanus et al. (2010) state that creatine supplementation increases lean body mass as well as strength, power, and efficacy in short-duration, high-intensity exercises.

The use of alkaline substances has been widely employed in various sports modalities and high-intensity exercise protocols, trying to improve performance by decreasing muscular fatigue, explain Krustrup et al. (2015). The sodium bicarbonate (NaHCO3) intake increases the blood concentration of sodium bicarbonate, which favors the hydrogen ion (H+) and lactate efflux of the muscle cell and, in this way, decelerate the acidification process, say McNaughton et al. (2018). Buffer systems or physico-chemical mechanisms reduce the blood's pH deviation through their ability to neutralize acids or bases, states Apostu (2010). For this reason, athletes try to block acidity and prolong exercise capacity by drinking sodium bicarbonate whose structure allows excess lactate buffering.

4. METHODOLOGY

The market for sports nutrition products is expanding but is nevertheless a quite new research field in the Balkan countries. There is a lack of available statistics on the segment. The guidance for the development of this questionnaire adapted to the environment being researched, was from the thesis of Clemo M.P., "The relationship between nutrition knowledge and performance measures in British Collegiate of American football athletes", February 2014 and the thesis of Basso G. and Moulin A. "The marketing influence of sports nutrition in the fitness market. The case of France", May 2017.

The questionnaire had 34 questions and it was divided into four sections, the first one representing general knowledge of the athlete, followed by questions regarding the nutritional supplement and their performance impact on the athlete, and the third one focusing on the communication strategies used for marketing the nutritional supplements. The last section was regarding the demographic information of the respondents. The questionnaire for this research included athletes from the running community, who are speedsters, endurance and combo runners – based on how they respond to training and racing, reaching responsiveness of 58 respondents conducted online, during October and November 2021 in the Republic North of Macedonia. The analysis was conducted using the statistical program SPSS. A qualitative research method was used to quantify the problem by generating data that can be transformed into useable statistics, especially for longitudinal research such as the one presented in this paper.

5. DISCUSSION OF RESULTS

All of the respondents unitedly voted that in fact they are practicing running as a sport. More than half of them practice running more than four times a week and running three times a week was chosen as a second most voted option. The most frequent discipline they classified they are running with 69% was a half marathon, followed by 10.000 meters and thirdly a full marathon. The rest of the disciplines were less frequently voted. Between 4-7 years the respondents had a history of running, while from 1-3 years was the second option voted. Only a small percentage was from 7-10 years of running. At this stage, most of the respondents, over 70% are at a competitive phase of their running process. Over 90% said they do have rest days as athletes. 75% of the respondents consider their healthy everyday diet to be pretty healthy on average. The perception of the athletes considers to be a nutritional supplement, from all provided answers, and the dominant answer was "protein powders" with over 70%, "multivitamins" with almost 60% and "BCAA's, glutamine, etc." as a third option near 50%. To this question, multiple answers were allowed. Over 90% classify themselves as athletes who do take nutritional supplements. The reason why they decided to consume nutritional supplements was mostly to improve exercise recovery and increase the energy in the body. Increasing the endurance was also at a large scale presented as a reason, as well as to enhance the overall athletic performance. Protein in fact is considered to be the main energy source while having high intensity training. Most athletes consider carbohydrates to be beneficial for their athletic performance and are not sure if creatine as supplementation is providing effective results in improving their endurance. It was followed by a small difference between disagreeing and not being sure whether consumption of caffeine as supplementation can decrease the perception of effort. The athletes were certainly not sure if sodium bicarbonate will help them in preventing the delayed onset of musical fatigue. However, they do agree that the nutritional supplements increase the amount of training they do and have an impact on their energy flow, along with the fact that nutritional supplements help

them cope with pain. A large percentage of the athletes as nutritional products stated they use "multivitamins" with 81%, "proteins" with 74% and amino acids with 33% as most frequently voted. To this question, multiple answers were allowed. 45% of them ranked they do feel nutrition is important for sports performance while only 25% out of all consider being the most important. The answers considering when they use the nutritional supplements vary in small percentages, between, consuming just before and after the event itself, adequate daily consumption as well as changing the pattern of intake at the time of completion. In regards to naming the top 3 nutritional supplements that increase their performance highly voted was "Protein" alongside "Creatine", different types of multivitamins and amino acids. Only one athlete stated beetroot juice as an option. Regarding how they have noticed an increased performance after using the above-named nutritional supplements, most of them stated they have a better recovery process, have achieved new personal best results and have a higher level of endurance. The athletes do not find any criteria related to food supplements that would stop them from doing sports. Considering the information obtained regarding nutritional supplements, the athletes chose to be the "Internet" with 58% as one of the highest voted resources alongside 52% from "Teammates or colleague", adding a Coach or a Fitness trainer as a third option with only 36%. To this question, multiple answers were allowed. Almost all the athletes buy their nutritional supplements from specialized shops and the Internet as a second option, which is seen in percentages is extremely close to personal selling as an option. They do research about the supplement before buying it. As well a large percentage does read the nutritional facts appointed on the label of the product. The highest quality product was chosen as the first option in terms of what are the top reasons, they choose to purchase nutritional supplements from this type of retailer, varying from only 2% to the option of "the best option for serious athletes". Having purchased a product from that retailer is also a highly voted option, alongside having the best product for their age. The least voted option was that the retailer was socially responsible. Word of mouth has the biggest influence on where to buy nutritional supplements, for athletes together with social media is the second biggest influencer. The least influence they get from sponsoring products. If the brand of the nutritional supplement is being reviewed by an established athlete, the respondents are highly likely to buy it. Also, if it is a well-known name or if there is a special offer or promotion for it. The most valid criteria they look for in a nutritional supplement is from the person who recommended the product to more than half of the athletes. If the desired results from consuming the product are previously shown they would also take that as a good criterion while buying. The price has also a solid impact. Most of the athletes that responded to this questionnaire were male 69% versus women 31%, at the age between 35-44 years old, and almost all of them were employed.

6.   FUTURE RESEARCH DIRECTIONS

There are three important future directions in this study before the future lines of research. The first one is an actual in-depth analysis of the athletes done in the field with one-on-one interviews that will be based on facts taken from the reports presented to the researcher, with confidentiality using more sophisticated methods and technologies that will segment the athletes into groups in addition to socio-demographic data and performance index.

Future research could validate the study in other countries where marketing strategies are widely integrated into the athletics communities with a special accent on National Athletic Federation as an institution. Future research should investigate types of sports-related nutrition that are enabled by marketing strategies, and identify their consequences.

Additionally, future studies could supplement the current model presented and explore the omics technologies in professional sport practice which provides an opportunity for a personalized (personified) approach for various areas, including nutrition and impact on the marketing communication strategies as a holistic approach.

7. CONCLUSION

From the results of the analysis, it can be concluded that in such a small community as the running community in the Republic of North Macedonia word of mouth and personal recommendations are the top channels when it comes to choosing the nutritional supplement, contrary to the well-known factors such as brand names of food supplements; visual differentiation through packaging which impacts impressiveness and abstract display of elements/effects on the packaging. A successful marketing strategy would be product presentation – communication-related to certain products and advice for their positive characteristics using a "third party". As expected social media, although not the first choice, has been proven as an important marketing channel for advertising and building marketing strategies for nutritional supplements that athletes very frequently refer to.

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Exploratory Analysis of the Promotional Activities of Krishna-Conscious Communities in Europe

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Abstract: *Marketing religions have been studied frequently in the past decades, however, there are still areas less covered by the literature. Krishna-conscious communities are considered as one of the most successful new religious movements is terms of marketing in the past decades. This research studies the promotion tools applied by the Krishna-conscious communities in Europe with the involvement of seven rural communities in six countries, where quantitative research was carried out to discover the initial means of encountering the religion and the exposure to the different promotion tools applied in the further phases of communication. The research results have shown that traditional tools of promoting Krishna Consciousness still have huge importance when people meet the religion for the first time, but in keeping longer term contact, media may be applied efficiently as well, but there is still space for improvement in the promotion tool portfolio.*

1. INTRODUCTION

There is competition among the various churches and religious groups to retain and attract followers as a result of the emergence of new religious movements and the coexistence of several religions in constrained geographic regions. The pool of potential followers is predetermined because there are only a finite number of people on Earth, but this number is growing. Churches seek to win the greatest share of this pool. This entails recruiting people from various religious backgrounds as well as obtaining new followers who may not have previously practiced religion. Many academics have referred to this member competition as a market scenario comparable to those researched in regard to products and services, where religious groups engage in specific marketing activities to outperform their rivals. (Becker, 1986; Crockett, 2016; Culliton, 1958; Einstein, 2008; Iyer, Velu & Mumit, 2014; Kedzior, 2012; Kuran, 1994; McAlexander, Dufault, Martin & Schouten 2014; Shaw & Thomson, 2011; Stark, 1997; Wijngaards & Sent, 2012).

Krishna consciousness was – and still is – one of the best known religions of their promotional activities, which were initiated by people stopping pedestrians on the streets, telling them all about the teachings of their Lord Krishna. Today, ISKCON (International Society for Krishna consciousness) has a significant number of churches, villages, and visitors' centers all over the world. They also conduct several festivals, participate in charity endeavors, and engage in active online and social media communication. Being able to attract the interest of more and more individuals in nations distant from India is an accomplishment that points to a clearly thought-out strategy that has strangely garnered little recognition in recent decades (Bence, 2014; Goswami, 2001; Harvey, 2000; Isvara, 2002; Kamarás, 1998; Klostermaier, 2000; Wuaku, 2012).

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2. THEORETICAL BACKGROUND

According to Juravle, Sasu, and Spataru (2016), religion should be included in the study area of services marketing, specifically non-profit marketing, based on three key factors that distinguish for-profit companies from non-profit ones: economic, legal, and social characteristics. Economically, we can discuss non-profit marketing when the object of the marketing activity is not a tangible good or a service that needs to be paid for, but rather something more ethereal, like a goal, a cause, or a set of beliefs. Legally speaking, the classification is obvious because it is controlled when we can discuss a non-profit business. From a social standpoint, nonprofit marketing focuses on more broad goals, such as modifying behavior or attitudes or promoting awareness, rather than on meeting a specific need (Juravle et al., 2016).

Juravle et al. (2016) proposed the application of the 7P of services marketing to religions as well, emphasizing that even though there are some notable differences in the goals, target audiences, and measures of services marketing and non-profit marketing, the general principles are similar. This was based on the classification of religions into the category of non-profit marketing (Juravle et al., 2016). However, they also took into account services offered by religious organizations, as well as several product categories, as the practical and concrete realizations of the services and the religion. Other studies have also concentrated on the similarities between religions and services (Bence, 2014; Hashim & Hamzah 2014; Iyer et al., 2014; Kuran, 1994; Shaw & Thomson, 2013). However, a large number of their elements are fixed by the basics of the religion and cannot be altered for better customer orientation, which is the biggest restriction on the use of the services marketing mix concepts on religions (Ann & Devlin, 2000; Bence, 2014; Juravle et al., 2016; McDaniel 1986; Mulyanegara, Tsarenko & Mavondo, 2010; McGraw, Schwartz & Tetlock, 2011).

Marketing of religion is also a sensitive topic: 'present and potential consumers' may regard promotion inappropriate for a religious organization – which is supposed to be non-profit. According to studies, many people believe that, despite being important for existence, churches' marketing and for-profit endeavors damage their reputation (Attaway, Boles & Singley, 1997; McDaniel 1986; McGraw, Schwartz & Tetlock, 2011; Kuzma et al, 2009).

According to Juravle et al. (2016), marketing religions may be the key to offsetting the negative effects of social change by promoting values and counterbalancing the negative effects of mass media; while it is also a key for religious communities to adapt to modern society in order to survive. Nowadays, most religious communities apply a wide range of different tools in order to keep contact with their followers and also to attract new people to the community. Most religious entities are present on Facebook, and some also use Instagram and YouTube, but at the moment the importance of these tools are still lower in the portfolio of most of them (Ann & Devlin, 2000; Bence-Kiss, 2019a; Chen, 2011; Hashim & Hamzah 2014; Wilson, 2012).

The way the fundamentals of Krishna Consciousness influence the marketing mix is an expressive example of religious economics with all its benefits and limitations (El-Bassiouny, 2014, 2015; Hashim & Hamzah, 2014; Sandikci, 2011; Sandikci & Jafari, 2013; Wilson, 2012). The principles of Krishna Consciousness determine the majority of the elements of the marketing mix, however, the example of Krishna-conscious farming communities shows how religion may overcome these boundaries by shifting the focus away from the marketing of the religion itself. The largest Krishna-conscious farming communities in Europe have solved both the challenges of limited marketing mix and prejudices of religious marketing by transforming the product

from religion to tourism by establishing farming communities all over the continent. These locations exhibit the most important aspects of the religion within a small settlement and attract a huge number of tourists all over the year. This shift has put the tourist attraction in the focal point of the marketing mix instead of religion, which is an area, where the 7Ps of service marketing is commonly applied. Moving the product into the realm of tourism has increased the freedom to change the components of the marketing mix: on the tourist level, religious communities may add certain components to create a complex touristic product, which suits the needs of the customers without violating the fundamentals of the religion, and they can set the other components of the marketing mix to reach the audience the most effectively (Aminbeidokhti, Zargar & Nazari, 2010; Bence-Kiss, 2019a; Bence-Kiss, 2019b; Mendoza Vargas & Culquitanta Salazar, 2019; Piskóti, 2007; Sheikhi & Pazoki, 2019).

3. RESEARCH METHODS

During the research different primary and secondary research methods were applied to get an insight into the area. During the secondary data analysis, articles and research concerning the topics of religious marketing and the promotion of religious communities were overviewed, with special respect to the existing works concerning Krishna Consciousness. Nine of the continent's eighteen farming villages, which range in size from small to large, answered the original inquiry and consented to take part in the follow-up study. The population of the three largest communities, Krisna Völgy (HUN), Radhadesh (BEL) and Bhaktivedanta Manor (GBR) were over 100 inhabitants and they are visited by approximately 20-30000 tourists a year. Four communities, Krisnuv Dvur (CZE), Almviks Gard (SWE), Simhachalam (GER) and Goloka Dhama (GER) had a population of between 30 and 60 devotees each and hosted about 2-3000 visitors a year. Due to the small population of ten inhabitants or below and not so enhanced focus on tourism, Prabhupada Desh (ITA) and Nova Ekacakra (SVK) were eliminated from the sample, and seven communities from six different nations were examined.

The aim of the research was to assess the effectiveness of Krishna Consciousness's promotion tools communities after learning about and analyzing the marketing mix of the organization in Europe and identifying the important components of their marketing toolbar. Paper-and-pencil questionnaires were distributed among the visitors of the farming communities, where a non-representative sample of 667 respondents answered the questions. Since the focus of the research was farming communities and the modified marketing mix of the religion where the product was shifted to tourism, it was ensured that all the respondents have already gotten acquainted with the newly created product. The majority of respondents have been to Krisna Völgy in Hungary, which was the area with the most active farming throughout the inquiry. The bulk of the research participants belonged to different religious communities (47,8%, 319 responses), were atheists (2,2%, 15 responses), did not belong to any religious group (16,9%, 113 responses), or preferred not to specify their religion (9,1%, 61 responses), but 23,8% of the respondents (159 replies) declared to be devotees of Krishna Consciousness. 13 statements were created concerning how often the respondents are exposed to the different marketing tools, which they had to evaluate on a Likert-scale of 1-5, where 1 meant 'Never' and 5 'Repeatedly'. The statements were formed based on field research and in-depth interviews carried out prior to the quantitative research phase.

The representatives of the communities taking part in the research validated and approved the questionnaire. SPSS 21.0 statistical software was used to evaluate the data that were gathered. Besides descriptive statistics and frequencies, in the case of nominal responses cross-tabulations

and the scale variables ANOVA tables were applied. The findings of the independent sample T-tests and the One-Way ANOVA tests were unreliable because, in the vast majority of cases, Levene's test of homogeneity revealed that the groups under investigation were not homogeneous and that their sizes varied. Welch ANOVA and Games-Howell post-hoc tests, which are more resistant to heterogeneity and various group sizes, were used to address these issues. In order to prevent replies from people already devoted to the faith from skewing the research findings, the tests were conducted both with and without Krishna-conscious respondents. (Malhotra, 2009; Sajtos & Mitev, 2007).

4.   RESEARCH RESULTS

In order to attract more followers, Krishna-conscious communities of Europe apply a wide range of methods of promotion, most of them focusing on the touristic product created by farming and rural communities. All the communities have an active websites and put a lot of emphasis on social media while applying traditional methods, such as fliers and posters as well. In order to determine a person's future interaction with the religious community, the quantitative research set out to identify the respondents' early places of encounter with religion. Although the initial questionnaire only focused on the very first point of contact with the religious community, the testing phase clearly indicated that many cannot remember the actual first contact point, while others were exposed to more than one source of information at the same time. Accordingly, in the final form of the questionnaire, the respondents were allowed to list more than one option, which they considered the most important regarding the beginning of their relationship with the religious community. 784 replies were received as a consequence, which is just a little bit more than the original sample size.

The most common form of encountering Krishna Consciousness was via a person already involved in the Krishna-conscious community, which was indicated by 198 (25,26%) respondents. This primarily refers to the evangelizing efforts of followers in the larger cities, as well as more casual interactions. 118 respondents, or 15,05% of the total, indicated that they had first encountered religion informally, such as through friends or family. There was overlap in six cases where the respondents listed friends or family members as well as devotees as the first point of contact, which is possible given that the friends or family members may already be devotees of Krishna Consciousness. Even though these six instances were only considered as one, the results nevertheless demonstrate that personal relationships and word-of-mouth, which combined account for 39,54% (310) of the responses, are the most significant ways that people come into contact with religion. Additionally, traditional media is important for reaching a wider audience because 23,59% (185) of initial encounters are with television programs (122, 15,56%) and newspaper articles (63, 8,03%). It's noteworthy that four respondents added the 1979 musical "Hair" to the "Other" section, which allowed respondents to add selections not previously listed. Members of the Hare Krishna Movement could be seen dancing and singing the Hare Krishna mantra in scenes from the legendary film.

Social media was mentioned only in 40 (5,10%) cases, out of which Facebook was by far the most common with 33 (4,20%) organic reaches and 7 (0,89%) mentions of advertisements, while Instagram appeared only in 3 (0,38%) responses. Other social media sources were not mentioned, neither organic, nor paid reaches. These numbers only make up a small portion of those using the previously mentioned tools, but since Krishna Consciousness has existed in these nations for more than 50 years and all of the communities were founded before social

media, many of the respondents had the opportunity to learn about Krishna Consciousness long before social media tools were widely used. In this regard, there were no appreciable variations across the age categories. Both younger and older respondents, including those over the age of 56, 66, and even 76, identified social media as one of their primary sources of contact.

A lower percentage of respondents—51 (6,50%), 44 (5,61%), and 37 (4,71%)—also noted books, festivals, and flyers, while only 1,53% (12) of interactions were attributable to tourist organizations. The lack of statistically significant variations between the various demographic factors demonstrates the diversity of the respondents' first experiences with Krishna Consciousness.

The respondents were asked how frequently they encounter information about Krishna Consciousness in their daily lives via various tools, and this information was utilized to calculate the frequency of further interactions with the religion. 647 correct answers to this question have been recorded. These statements included the goods and services provided by the various Krishna-conscious institutions, with a focus primarily on the tourist product, except for personal proselytizing and book selling, which, as we could see, are among the most crucial points of contact. The question focusing on the first encounter included tools promoting Krishna Consciousness in general.

Table 1. Frequency of exposure of the respondents to the marketing tools
of Krishna-conscious institutions by means

	N	Mean	Std. Dev.
I meet people selling books about Krishna Consciousness on the streets.	587	2,41	1,306
I see Facebook posts of a Krishna-conscious village in my news feed.	645	2,36	1,628
I see posters about the events organized by the Krishna-conscious community nearby.	643	2,29	1,32
I see Facebook advertisements about a Krishna-conscious village.	644	2,27	1,485
I see fliers about festivals of Krishna-conscious communities.	646	2,18	1,246
I receive newsletter from a Krishna-conscious community.	636	2,07	1,577
I see Krishna-products sold in shops or online.	647	2,06	1,198
I see YouTube videos of a Krishna-conscious village.	642	2,02	1,449
I see educational offers of Bhaktivedanta College.	636	1,85	1,372
I see advertisements of Govinda Restaurants.	636	1,77	1,237
I see TV shows about Krishna-conscious communities.	643	1,62	1,038
I see posts of a Krishna-conscious village on Instagram.	642	1,51	1,126
I see tourism agencies advertising a Krishna-conscious village.	644	1,46	0,928
Valid N (listwise)	551		

Source: Own elaboration

With 2,41 as the highest value in Table 1, the means of the replies in all situations are fairly low, indicating that the majority of respondents do not frequently receive information about Krishna Consciousness through the methods described. Only official forms of promotion were listed in this question, so there was no chance to list information from friends and family. Nevertheless, personal interactions continued to be the most significant method of contact, with a mean of 2,41 (Std.=1,31). The least common source of information was from travel agents (M=1,46; Std.=0,93). Facebook posts from a Krishna-conscious farming community were the second most frequently high-ranked mode of information acquisition in the case of recurrent encounters (M=2,36; Std.=1,63), and Facebook adverts likewise attained a mean of 2,27 (Std.=1,49). The third and fifth highest means were given to flyers (M=2,18; Std.=1,25) and posters (M=2,29;

Std.=1,32). This demonstrates that, despite the fact that few respondents mentioned social media when asked about their first encounter, it is an effective tool for maintaining participation over time, whereas the effectiveness of other marketing tools is typically low and direct contact is still the most effective form of communication.

Figure 1 shows that the low means in table 1 are mostly due to the enormous number of "Never" responses, which, in the majority of situations, accounted for more than 30% of the total responses. Personal encounters were the lone exception, with respondents most usually selecting "Seldom" as the answer. The tools that the majority of respondents (140, 21, 64%) reported being frequently exposed to were Facebook posts from farming communities that practiced Krishna consciousness, while 103 (15, 92%) reported being frequently exposed to Facebook advertisements. This finding once again demonstrates the importance of these institutions focusing on their social media presence, particularly on Facebook. The newsletters of the rural villages were another instrument that frequently (113, 17,47%) received the response "Repeatedly." This information is crucial because signing up for a newsletter necessitates giving contact information, which shows additional interest in community life. However, as table 1 and figure 1 show, few people are exposed to various promotional tools daily. The majority of respondents receive information via various communication methods infrequently or never.

Figure 1. Frequency of exposure of the respondents to the marketing tools of Krishna-conscious institutions broken down to separate responses (number of mentions)
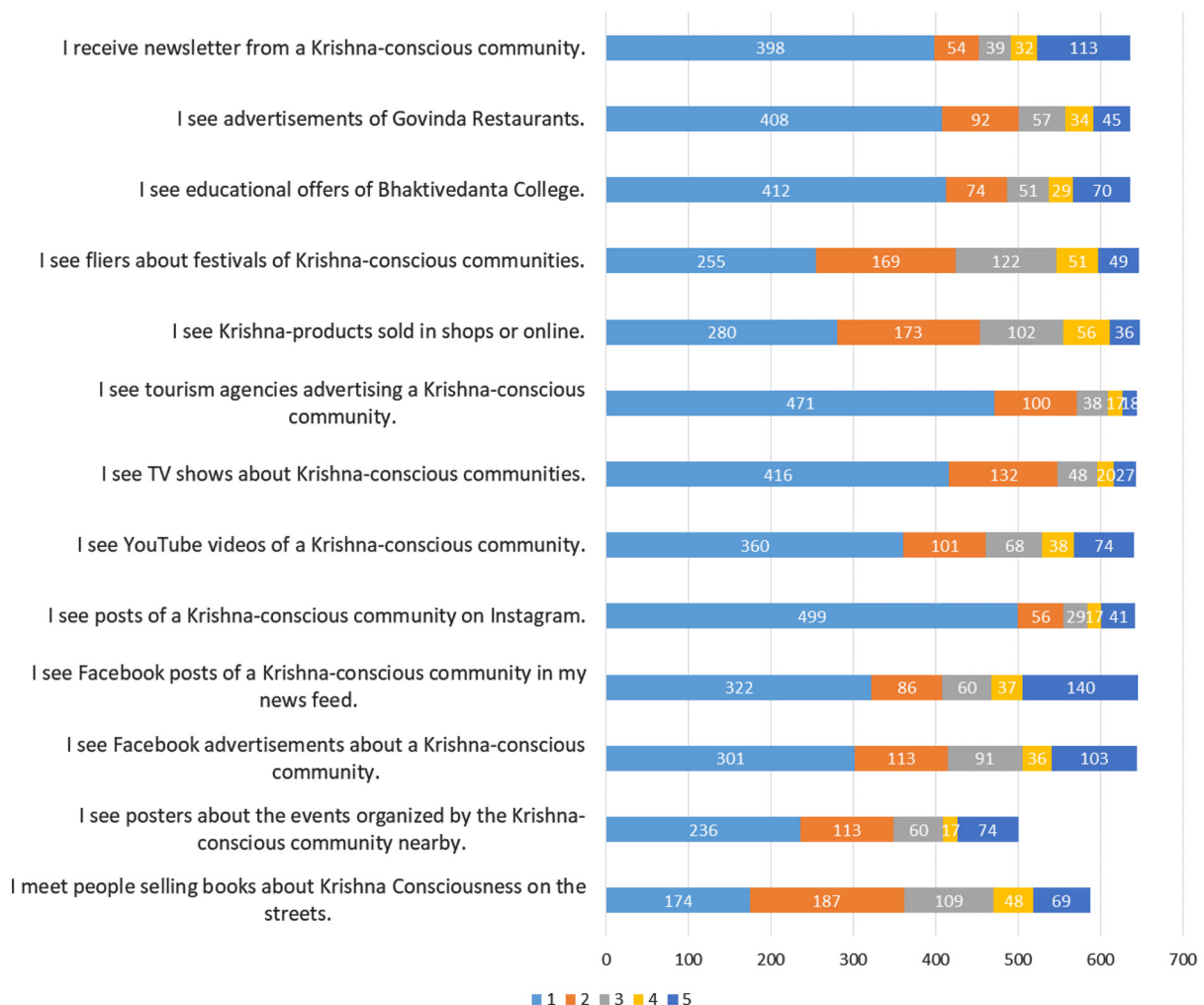
Source: Own elaboration

Significant differences were discovered concerning the gender, age and level of education of the respondents and the exposure to the different promotion tools. Women were more often exposed to many of the promotion tools including Facebook advertisements (p=0,000), Facebook posts of the rural communities (p=0,000), they see television programs concerning the farming communities more often (p=0,010) and meet devotees proselytizing selling books on the streets more frequently too (p=0,001). However, male respondents receive newsletters more often than women do, which indicates that different communication tools may be applied concerning men and women efficiently.

Important differences were discovered concerning the age of the respondents too: those between 26 and 55 years are the most exposed to many promotion tools, while those 56 years old or older meet any form of communication less often. Interestingly, not only the elderly, but also respondents 18 years old or younger were less exposed to fliers (p=0,000) and posters (p=0,000) than those between 26 and 55. Respondents of 56 years or older have also shown significantly lower exposure to Facebook posts (p=0,000) and advertisements (p=0,000), YouTube videos (p=0,000) and products sold by the Krishna-conscious communities (p=0,000). Surprisingly, the respondents between 36 and 45 years were the group most exposed to television programs on Krishna-conscious communities (p=0,000), while those 56 years old or older were exposed significantly less often.

The level of education turned out to be another significant factor; the respondents with a university level of education showed more frequent exposure to posters (p=0,000), fliers (p=0,000), Facebook advertisements (p=0,001) and the ads of Govinda Restaurants (p=0,000) and Bhaktivedanta College (p=0,000) than those with high school or technical or vocational school education. Holders of university degrees have also shown significant differences from those with elementary school education concerning exposure to Facebook posts of the rural communities (p=0,008), but no difference appeared compared to other levels of education in this sense.

Those living in the capital accounted for higher exposure to posters (p=0,000) and fliers (p=0,000) and meeting proselytizing devotees more often (p=0,045) than inhabitants of regional centers, which is not surprising, as these activities are typically centralized; however, interestingly no differences were shown concerning other types of settlements. Respondents from the capital were also more exposed to advertisements of Govinda Restaurants (p=0,001) and the Bhaktivedanta College (p=0,001), naturally, since these are most often located in capitals too. These results suggest that there is a heavy geographical emphasis on the capital compared to other larger towns, which reveals areas for further improvement to target the significant audiences available in these settlements too.

Considering the results of the quantitative research one may think that the marketing model of Krishna-conscious communities is not successful, since the frequency of exposure to the different promotion tools is generally low. However, previous research (Bence, 2014; Bence-Kiss, 2019a; Bence-Kiss, 2019b) have shown that most of the tourists arriving to the Krishna-conscious communities are newcomers and may only account about their first encounters with the religion, but not so much about frequency of the exposure yet. This emphasizes the importance of the tools – primarily personal contact, but also traditional promotion tools and social media – accountable for the first encounters; but also raises the need for focusing on retention and loyalty. The touristic product may foster promotion differently too: as the research has shown, personal encounters are the most important initial form of making contact with the religion, including word-of-mouth. Applying the touristic product and the elements of the marketing mix to

provide visitors with positive experiences may have an important effect on spreading the word about the religion. This way all the seven elements of the marketing tools contribute to the promotion of the religion indirectly. In the process of promoting religion, the tourist product may not be the most important first contact, however, in the second phase of transmitting knowledge its significance is much higher. It was visible that currently, Facebook is the most important tool in the social media communication of religious communities, which may reach a wide range of audiences in terms of age, but limited in terms of education for example. The research results suggest that the range of the promotion toolbar needs to be extended not only considering the marketing trends and technological advances but also keeping the demographic characteristics of the audiences in mind; as different segments may be reached via various channels in terms of age and education level. There is also a heavy geographic focus on the capital, which may be extended to larger regional centers at least to reach broader audiences.

5. FUTURE RESEARCH DIRECTIONS

This research is only a pilot in this field and there is still a lot of work to do. Extending the sample further in population, geographic location and religion may result in more reliable information and robust conclusions, which may support marketing religions – not only Krishna Consciousness but religions in general as well. As researchers (Chen, 2011; Juravle et al., 2016) have highlighted, studies and religious marketing activities usually do not follow the advance of present times, which calls for innovation in the application of marketing practices and studies. Communities devoted to Krishna Consciousness are pioneers in terms of applying new media for promoting religion, which could be a way to go for other communities as well.

6. CONCLUSION

Marketing religions has become an area more often studied in the past decades, however, there are still areas less covered by the literature. Krishna-conscious communities are considered as one of the most successful new religious movements in terms of marketing, being able to attract large audiences in the past decades. Just like any other religion, their activities are also bound by religious economics limiting most of the elements of the marketing mix, leaving the highest level of freedom in terms of promotion. Krishna-conscious communities of Europe have overcome this problem by establishing farming communities serving as touristic destinations. This shift of focus from religion to tourism in terms of marketing has not only created a new means of transmitting knowledge about the religion but also opened up a wide range of promotion opportunities for the religious community to operate with. This research studied the promotion tools applied by the Krishna-conscious communities in Europe – including those bound to the tourist destinations and the traditional means of promoting the religion – with the involvement of seven rural communities in six countries, where quantitative research was carried out to discover the initial means of encountering the religion and the exposure to the different promotion tools applied in the further phases of communication.

According to the research, word-of-mouth advertising, which is a method not directly under the control of religious communities but which can be effectively boosted by increasing the number of visitors in rural communities and ensuring their positive experiences, was one of the most effective methods for promoting first encounters with religion. Social media, while not very effective for initial interactions, proved to be significant in the long run. The majority of respondents cited Facebook sites as a recurrent source of information on Krishna Consciousness.

It is clear that the target groups of each promotion tool may differ, therefore the widening of the portfolio could ensure reaching wider audiences more successfully. Tools should be found to reach the generations younger than 18 years and older than 56, and to be able to attract those with a lower level of education too. Geographical focus should be expanded to more variable settlement sizes and types as well. In ongoing research, it is being examined how these promotion tools may affect the involvement of visitors in the life of the religious community, while further research could be extended to a higher number of farming communities, also outside Europe to get a broader picture of the marketing mix of Krishna-conscious communities in the world.

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Development of 21st Century Skills in Croatia's Higher Education System*

Dinka Dedukić[1]

Abstract: *Social and economic developments of the 21st century require education systems that enable young people to acquire knowledge, skills, and competencies which, upon completion of their studies, would work in their favour and allow them to actively participate in the globalised and competitive labour market. Although the low employment rate is often caused by economic factors, one should also account for the interpersonal factors that may help individuals increase their chances of finding a job. Job seekers nowadays need to possess competencies known as 21st-century skills. This study included an assessment of the 21st-century skills acquired during academic studies. Creativity, innovation, communication in foreign languages, and practical application of knowledge were found to be the most poorly developed competencies, whereas the ability to work in a team, learn, and manage information were among the best-developed competencies.*

1. INTRODUCTION

Education systems need to keep up with the social and economic developments of the 21st century to enable young people to acquire knowledge, skills, and competencies which, upon completion of their studies, would work in their favour and allow them to actively participate in the globalised and competitive labour market and thus underpin economic development in a system where one's competitive edge, and hence value, is based on knowledge, skills, and competencies (Ananiadou and Claro, 2009). Although the low employment rate is often caused by economic factors, one should also account for the interpersonal factors that may help individuals increase their chances of finding a job. It has been shown that, in addition to specialist knowledge and skills, one also needs soft skills to enter employment.[2] The combination of soft and hard skills is found in literature under the umbrella term *21st-century skills (*Hadiyanto, et al., 2021; Ananiadou and Claro, 2009). One reason why 21st-century skills are becoming increasingly important lies in the very nature of work which is changing at an increasing pace, namely jobs are becoming less formal, less structured and go beyond the routine. Term *21st-century skills* designates skills driven by the needs of the emerging models of economic and social development rather than those of the last century which were tailored to meet the needs of industrial production (Ananiadou and Claro, 2009). The Croatian Science Foundation has launched a programme called Building Institutional Quality Assurance Mechanisms and has also created financial instruments to support a number of higher education initiatives and efforts that would ensure the quality of higher education outputs and fulfilment of the latest eco-

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[2]   *Soft skills* is a term that indicates personal transversal competencies such as social skills, communication skills, ability to work in a team and other personality traits that characterize relationships between people (Cimatti, 2016).

nomic needs (Croatian Science Foundation, Higher Education and Technological Development of the Republic of Croatia, 2007). The question that arises is whether the measures adopted to ensure the quality of education in Croatian higher education institutions result in the acquisition of 21st-century skills. This paper will discuss 21st-century skills and Croatia's higher education system, and present the survey results based on the views of respondents i.e. students, about the extent to which these competencies are developed in their school/study programme.

2. 21st CENTURY SKILLS

Key competencies required for lifelong learning are essential if one is to meet their personal, social and professional needs (AZVO, 2021). The concept of key competencies is closely related and largely intertwined with the concept of soft skills – namely, the skills that supersede higher education qualifications in job interviews. In the workplace, soft skills are seen as complementary to the knowledge and abilities one acquires through formal education. They characterize the way a person communicates to others, especially at work. Soft skills have more to do with who people *are* than what they *know*. As such, soft skills encompass traits that are much harder to learn, at least in a traditional classroom setting. They are also much more difficult to quantify and assess (Development and Education Centre Novo Mesto, 2018).

In order to hire someone, present-day employers require a balance between expert knowledge/hard skills and soft skills. Businesses have been placing great value on the soft skills that can be applied at the company level, such as the ability to work in a team, and that trend is increasing. Performance and productivity improve when workers share their knowledge and skills. The ability to learn new methods and technologies is also a soft skill valued among employers, along with problem-solving ability and IT literacy. For example, companies can perform more efficiently when all workers can solve minor software problems, rather than rely on the IT department for every fix. The concept of 21st-century skills stems from the modern business practices that have been insisting on the balance between expert knowledge/hard skills and soft skills (Ananiadou and Claro, 2009; WEF and BCG, 2015). They comprise broad knowledge and a wide range of skills, work habits and personality traits that are important for success in today's world, especially in modern careers and workplaces. Even though specific 21st-century skills can be defined, categorized, and determined depending on the workplace or educational institution, the term as such is rather general and quite fluid. The following list provides a brief overview of knowledge, skills, work habits and personality traits usually associated with 21st-century competencies (Ananiadou and Claro, 2009; WEF and BCG, 2015; Development and Education Centre Novo mesto, 2018):
- critical thinking and problem solving,
- information analysis, interpretation, and synthesis,
- research and testing skills,
- creativity, curiosity, imagination, innovation,
- persistence, self-motivation, planning, self-direction, adaptability, initiative,
- oral and written communication, public speaking and presentations, listening,
- leadership skills, teamwork and collaboration,
- IT and communication literacy, media and internet literacy,
- civil, ethical, and socio-legal literacy,
- economic and financial literacy, entrepreneurship,
- global awareness, multiculturalism, and humanitarianism,
- understanding of the ecosystem,
- health literacy, including diet, exercise and public health.

The concept of 21ˢᵗ-century competency reflects the belief that pupils/students should be taught the most relevant, useful, and universally applicable skills and knowledge. The underlying idea is that today's pupils, students, and young people who will reach old age in the 21ˢᵗ century need to master a set of skills different from one required in the 20ᵗʰ century and that the skills they learn need to meet the specific requirements of the complex, competitive economy and a knowledge-based society, in the information age of the 21ˢᵗ century.

The common perception is that most educational institutions do not pay enough attention to the preparation and ultimate success of their students in the 21ˢᵗ-century labour market, and advocating for the education system to place greater emphasis on interdisciplinary competencies and 21ˢᵗ-century skills is the common response whenever this issue is raised (Obadić, 2017). The question arises as to the true purpose of education. Is the purpose of education to get pupils/students to pass the exam and get a degree? Or is its purpose to enable pupils/students to be competitive and successful in the labour market and modern careers? The need to strengthen 21ˢᵗ-century skills is driven by the belief that all pupils/students should possess knowledge, skills, work habits, and character traits that will enable them to continue learning and improving themselves after graduation and that young people should be adequately prepared before they enter the labour market of the 21ˢᵗ century.

3. HIGHER EDUCATION IN CROATIA

Given that European societies strive to become knowledge-based societies, higher education is a key part of their socio-economic and cultural development (ESG, 2015). This aim is most clearly defined in the European Commission's *Europe 2020* document setting out three priorities that complement each other: 1) smart growth: developing an economy based on knowledge and innovation; 2) sustainable growth: promoting a more resource-efficient, greener, and more competitive economy; 3) inclusive growth: fostering a high-employment economy delivering social and territorial cohesion. All the measures defined in this document serve the ultimate purpose of creating a European environment conducive to growth and employment, as this is the only way to continue to finance the existing way of life (European Union Policies, 2015). According to the European Qualifications Framework for lifelong learning (EQF), *qualification* is a formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards. In the EQF, learning outcomes are defined as statements of what a learner knows, understands and is able to do on completion of a learning process. Learning outcomes are divided into three categories — such as knowledge, skills, and competence, where *competence* means the proven ability to use knowledge, skills, and personal, social and/or methodological abilities, in work or study situations and professional and personal development. The nationwide harmonisation of competencies according to learning outcomes in Croatia began in March 2006, when the development of the Croatian Qualifications Framework (CQR) started. CQR is an instrument for unifying and coordinating all parts of the qualification system in Croatia. It enables quantification and mutual comparison of learning outcomes and enables the school and education programmes to respond to the demands of the labour market. The curricula were analysed to determine whether the teaching methods lead to the achievement of the ultimate goal, i.e. the ability to apply knowledge in practice. Competencies as outcomes of education are measurable and their value exists only in terms of their practical applicability.

4.   OBJECTIVES AND METHODOLOGY

The aim of this study was to find out the extent to which students believe that they have developed 21st-century skills i.e. to what extent the development of these skills was fostered and realised throughout their studies. The study was conducted in 2018, with a total of 1041 students participating. The results represent the respondent's beliefs and own judgments. Respondents were students of the four largest Croatian universities, more specifically the students attending schools that had been enrolling the largest number of students in the previous ten years, according to the Croatian Bureau of Statistics (CBS, 2017: 483-502; CBS, 2016: 505-524; CBS, 2015: 513-530), which means the largest number of workers with such qualifications in the labour market. The universities whose students participated in the study are: University of Rijeka (School of Economics, Law School, Engineering School, School of Humanities and Social Sciences — Department of Pedagogy and Information Science Department); University of Split (School of Economics, Law School, School of Electrical Engineering, Mechanical Engineering and Naval Architecture, School of Humanities and Social Sciences - Department of Pedagogy); University of Zagreb (School of Economics, Law School, School of Electrical Engineering and Computing, School of Humanities and Social Sciences — Department of Pedagogy and Department of Information Science); and Josip Juraj Strossmayer University of Osijek (School of Economics, Law School, School of Electrical Engineering and School of Humanities and Social Sciences - Department of Pedagogy and Information Science). A survey questionnaire was selected as a primary means of collecting data, namely students' answers to questions. The survey was conducted in the academic year 2017/2018. The author opted for deliberate sampling, which she conducted herself. Scheduling of final year classes presented a challenge and ultimately prolonged the period in which the survey was conducted.

5.   RESULTS

This section presents the results of the study on the development of 21st-century skills in relation to the school/study programme the respondents attended. The extent to which individual competencies are developed among students of economics, law, technical sciences, information sciences and pedagogy will be analysed. Respondents were attending the final year of study (Year 2 of graduate studies) and assessed the level of development of individual competencies on a scale of 1 to 5 where: 1-unsatisfactory, 2-poor, 3-good, 4-very good, 5-excellent. The 21st century competencies assessed were: creativity/innovation, critical thinking, problem-solving ability, decision-making ability, flexibility and adaptability - the ability to adapt to a new situation, cooperation - the ability to work in a team, ability to communicate - communicativeness, oral and written communication in a foreign language, basic computer skills, the ability to manage information - collecting and analysing information from various sources, research and questioning - research skills, ethical commitment, the ability to apply knowledge in practice, leadership skills - leadership and responsibility, appreciation of diversity and multiculturalism, initiative and self-management, learning skills, ability to organize and plan, ability to criticize and self-criticize, self-motivation for work.[3]

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[3]   See: Common European Framework of Reference for Languages, Digital Competence Framework, Entrepreneurship Competence Framework, PISA Programme Competence.
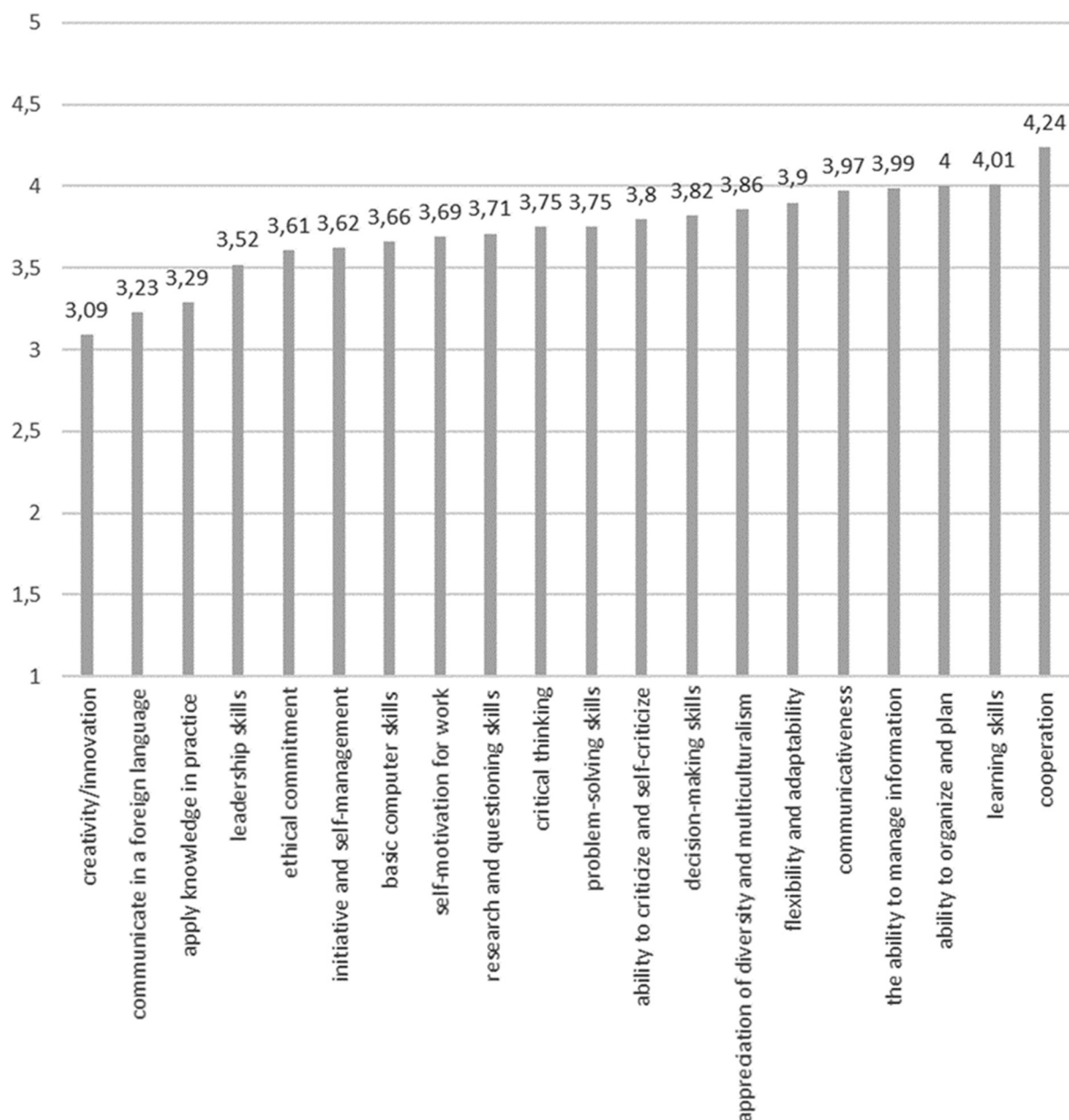
Figure 1. Students' competencies - Schools of Economics

Source: Dedukić, 2018 - Primary survey results

Picture 1 shows that the respondents think that the schools of economics invest the least effort in developing creativity and innovation, then communication in a foreign language and finally the ability to apply knowledge in practice. These competencies were given a score of 3 (3.09 — 3.29 - good) by the respondents. According to the respondents, the following competencies are being developed to the highest degree: collaboration, learning skills, ability to organize and plan and manage information (score 4 — 4.24 - very good). None of the competencies were given scores of 1 (unsatisfactory), 2 (poor) or 5 (excellent).
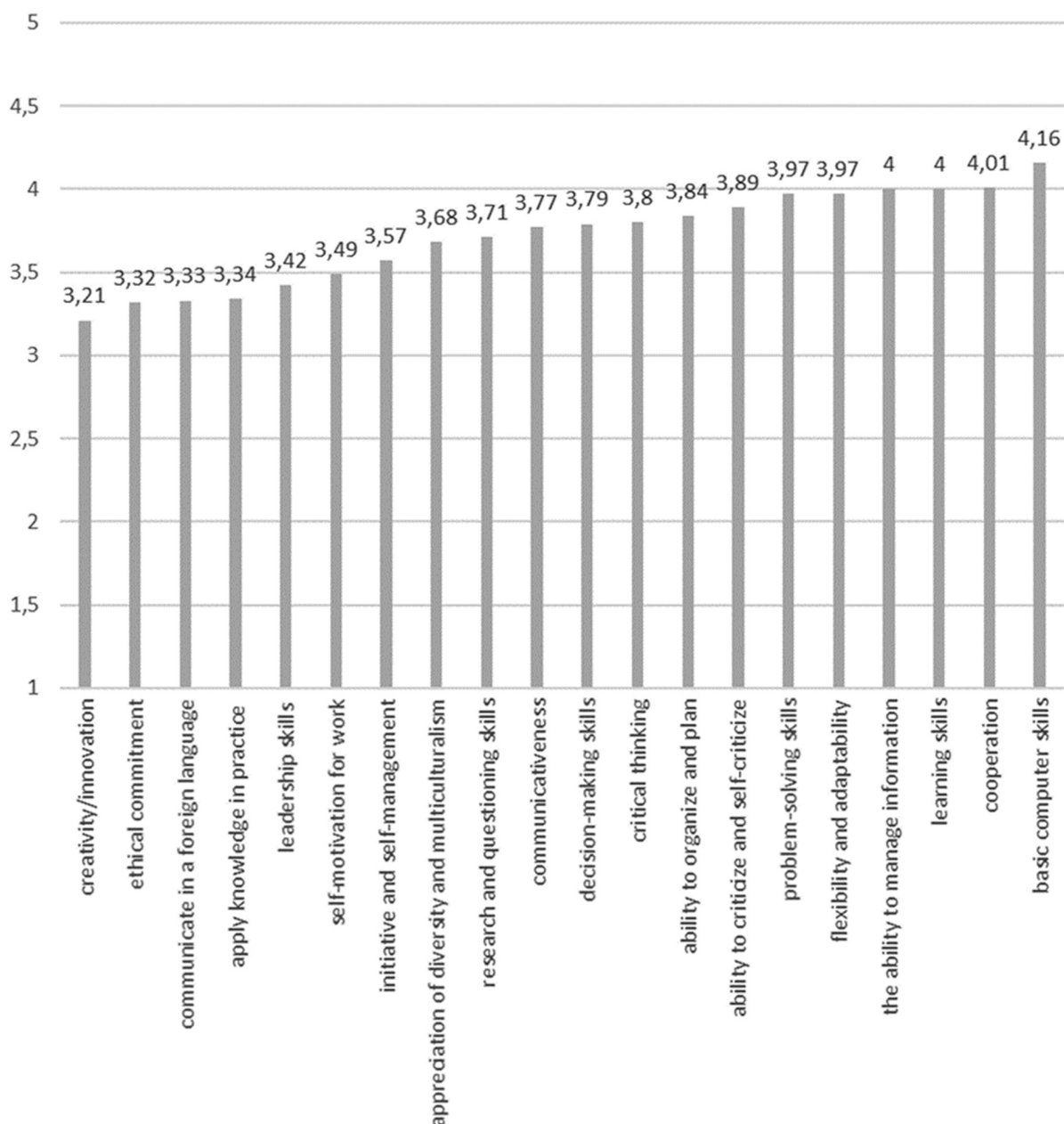
Figure 2. Students' competencies - Schools of technical sciences
Source: Dedukić, 2018 - Primary survey results

Picture 2 shows that the respondents think that the schools of technical sciences invest the least effort in developing creativity, ethical commitment, and communication in foreign languages. These competencies were given a score of 3 (3.21 — 3.33 - good) by the respondents. According to the respondents, the following competencies are being developed to the highest degree: collaboration, teamwork, learning skills, and information management skills (score 4 - 4.16 - very good). None of the competencies were given scores of 1 (unsatisfactory), 2 (poor), or 5 (excellent).
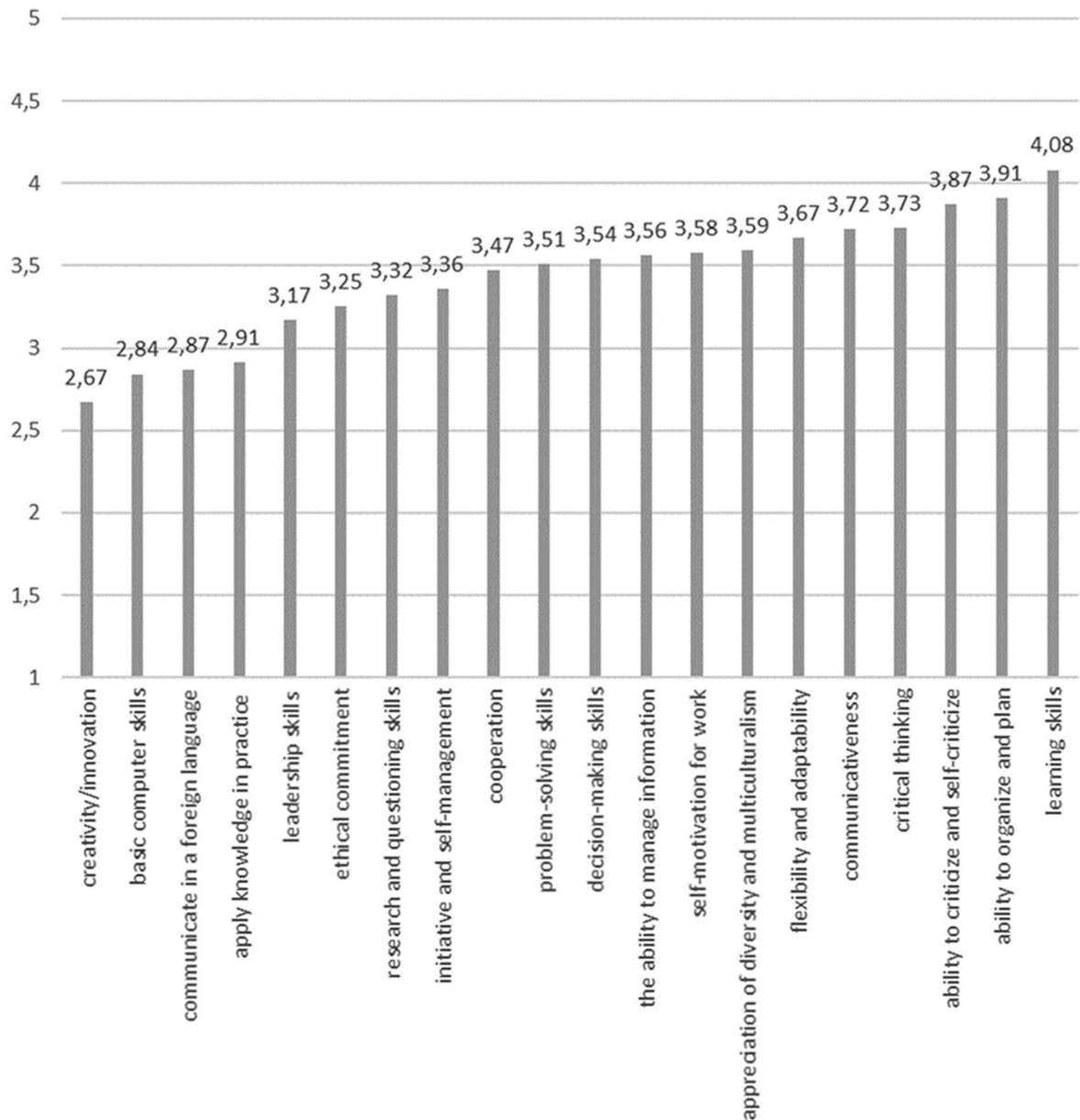
Figure 3. Students' competencies - Schools of law
Source: Dedukić, 2018 - Primary survey results

Picture 3 shows that the respondents think that the schools of law invest the least effort in developing creativity, computer skills, and communication in foreign languages. These competencies were given a score of 3 (2.67 — 2.87 - good) by the respondents. According to the respondents, the following competencies are being developed to the highest degree: learning skills, ability to organise and plan, ability to criticise and self-criticise (score 3,87 — 4.08 - very good). None of the competencies were given scores of 1 (unsatisfactory), 2 (poor), or 5 (excellent).
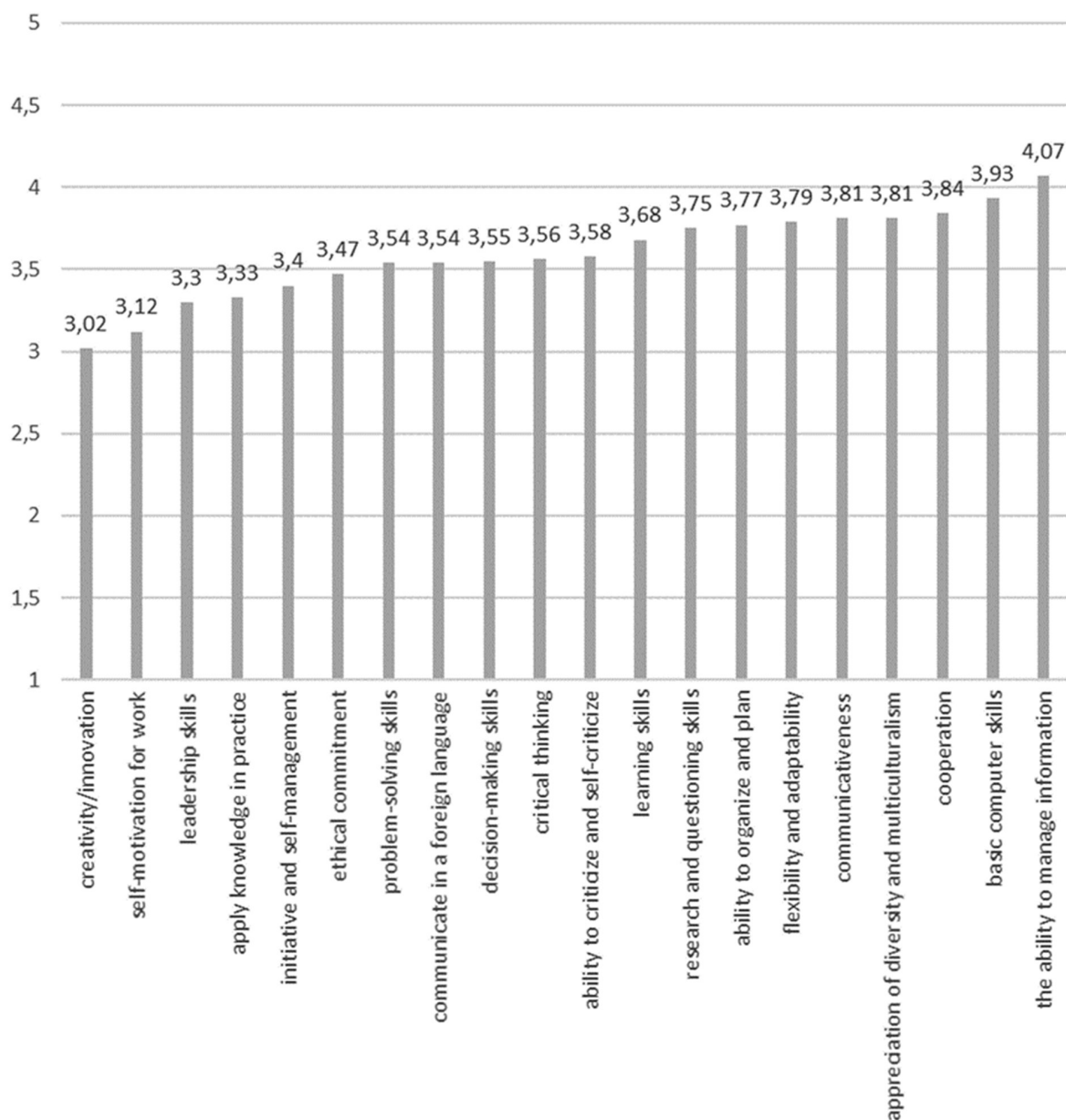
Figure 4. Students' competencies - information sciences programmes
Source: Dedukić, 2018 - Primary survey results

Picture 4 shows that the respondents think that the schools of information sciences invest the least effort in developing creativity, self-motivation for work, and management skills. These competencies were given a score of 3 (3.02 — 3.3 - good) by the respondents. According to the respondents, the following competencies are being developed to the highest degree: information management skills, computer skills, and teamwork (score 3,84 - 4.07 - very good). None of the competencies were given scores of 1 (unsatisfactory), 2 (poor), or 5 (excellent).
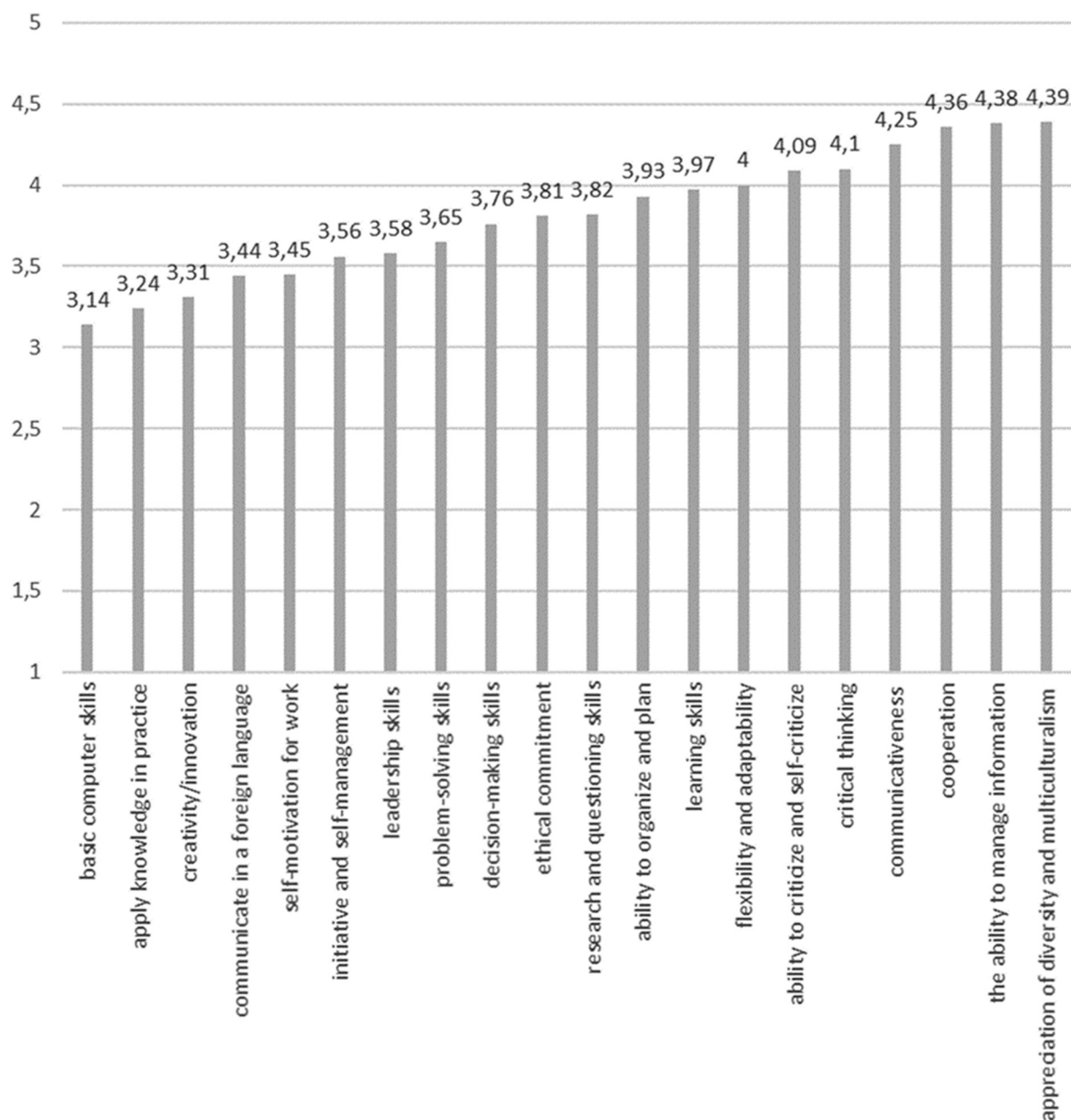
Figure 5. Students' competencies - pedagogy study programmes
Source: Dedukić, 2018 - Primary survey results

Picture 5 shows that the respondents think that the pedagogy study programmes invest the least effort in developing basic computer skills, the ability to apply knowledge in practice, creativity and innovation. These competencies were given a score of 3 (3.14 — 3.31 - good) by the respondents. According to the respondents, the following competencies are being developed to the highest degree: information management skills and teamwork (score 4.36 - 4.39 - very good). None of the competencies were given scores of 1 (unsatisfactory), 2 (poor), or 5 (excellent).

6.   CONCLUSION

Higher education, science, and innovation are cornerstones of social cohesion, economic growth, and global competitiveness. However, the increase in employers' demand for skills and competencies requires a change in the higher education system if it is to supply them. Therefore, education systems are to be brought up to date to teach young people modern skills and to align with the needs of the modern economy. Education institutions should test more than just knowledge of content, i.e. hard skills. Instead, they should teach a combination of basic and new knowledge and soft skills such as teamwork, communication and leadership. This study sought to establish the extent to which the Croatian higher education system develops the 21st-century skills of students. From the analysis of the study it follows that the competencies found to be developed to the lowest degree among the respondents are: creativity and innovation, oral and written communication in foreign languages, and the ability to apply knowledge in practice (score 3 — good). The competencies that the respondents found to be developed to the highest degree are: teamwork, learning skills, information management skills (score 4 - very good). Interestingly enough, the respondents did not give scores of 1 (unsatisfactory), 2 (poor) or 5 (excellent) to any of the competencies presented to them. For young people, finding work is one of the major steps in their transition into adulthood. In countries where education is not sufficiently aligned with the latest demands of the labour market, young people face a number of obstacles to employment and are often left to their own devices when it comes to being competitive after completion of formal education — which includes various courses and seminars as a form of form additional training, to acquire knowledge that was not acquired during education.

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Changes in the Educational Structure of the Workforce in Slovakia and Its Regions

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Abstract: *Educational attainment plays a critical role in everybody's employment options. Education determines human development, and affects the economic development of countries. For this reason, the educational structure of the population has long been considered an important indicator of the overall maturity and development of the country. In connection with technical progress and the use of advanced technologies, the demands for tertiary education attainment in the workforce are growing. The purpose of the paper is to evaluate changes in the structure of the workforce in terms of educational attainment in the Slovak Republic and to find the relationship between the educational attainment and economic performance of the regions of the Slovak Republic. The educational attainment of the workforce in the Slovak Republic is developing positively. However, significant regional differences have been identified, and it is possible to see a big gap between the Region of Bratislava and the remaining Slovak regions. In recent years, there has been a marked improvement in the educational attainment of the workforce in the Region of Košice. Tertiary education attainment of the workforce has an impact on the creation of regional gross domestic product per capita.*

1. INTRODUCTION

Education plays a vital role and performs many important functions in society. From the economic point of view, the function of education is perceived as an interplay between economy and education (Žižková et al., 1989). The authors argue that the economic effects of education contribute considerably to the development of the subjective factor of the social reproduction process, to the development of the workforce qualification and work-related abilities. Thus, the educational structure of a country's workforce is considered to be a major factor in determining how well the economy of the country will perform.

The paper attempts to identify changes in the labour force structure in the regions of the Slovak Republic and to investigate the relationship between the educational attainment and economic performance of the Slovak regions.

2. LITERATURE OVERVIEW

Human capital refers to a special form of capital, whose representatives are human beings with their qualities, experience, knowledge. Human capital is also defined as the ability of people to create new knowledge or as the totality of innate and acquired abilities, knowledge, experience,

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habits, motivation and energy that people possess and can use to produce products over a period of time (Vidova, 2018). Although intangible, human capital is inseparable from human beings and is associated with their physical form. It is the priceless and most important economic resource of society, and the main factor of economic growth and an important source of competitive advantage (Krajňáková, 2014).

The value of human capital is closely related to a person's age and education. Hajšová (2014) believes that the knowledge that an individual acquires, whether through education or experience, has a significant impact on the formation and transfer of an individual's human capital to the benefit of groups, institutions and society. According to Bobáková (2018), highly skilled and educated people are better adaptable to changing labour market, and the individual returns to their work and education are high in terms of wages. Belajová et al. (2014) state that higher levels of education and training provide individuals with a greater chance of getting and retaining a job or finding a new one. On the one hand, good education serves to increase an individual's socioeconomic status. On the other hand, human capital also has benefits of non-economic nature, as well-educated people have better health and live longer. In addition, education has impact on civic participation, such as volunteering and charitable giving. Education is an important factor of human capital. It is the outcome of learning. It is a process, in which the informative element is the strongest one, and under which individuals acquire and learn a body of knowledge, skills and habits as well as the methods of acquiring them. The body of knowledge has specific purposes as it serves to pursue a career or to cultivate or shape human personality (Ďurič, Hotár and Pajtinka, 2000, p. 500). The quality of education determines skills in the adult population, composition of the workforce (the share of those employed in low-skilled occupations) and the quality of the business environment (Karšay, 2019). In their paper, Zhao and Watterston (2021) cite several authors (Duckworth and Yeager, 2015; Zhao et al. 2019) who maintain that the acquisition of a set of skills, such as creativity, curiosity, critical thinking, entrepreneurship, collaboration, communication, global competence, and other skills is on the rise in the field of education. In addition, IT skills have been highly demanded by the labour market. That is why the skills required from workers have been altered. Strong emphasis has been placed on problem solving skills, creativity, socioemotional skills, functional literacy and technical skills related to the use of digital technologies (Jandrić & Ranđelović, 2018). Technological innovation is expected to affect the size of the labour market. In the Europe 2020 strategy, An Agenda for New Skills and Jobs was among the key initiatives to modernise labour markets and empower people by developing their skills throughout the lifecycle (Martynenko and Menshykov, 2017). Labour market needs for change also affect the development and growth of a country's economy and its regions.

Belajová and Fáziková argue (2005) that changes in a region's economy can lead to growth, development, stagnation or decline of the region. The authors note that economic development goes hand in hand with qualitative changes in the region, such as improvements in the environment, better technology to provide health, education or other services, better development-related value parameters, an increase in the workforce qualification level, etc. Tvrdoň and Šuranová (2007) believe that the essence of regional and EU competitiveness is represented by two indicators, i.e. productivity and employment in the regions. The indicators are under the influence of both internal factors, which are based on the position of businesses in the region and external factors, represented by states and regions. External factors encompass for instance the sectoral structure of the economy, technological and technical innovation, infrastructure (both technical and intellectual), organisation, governance, capacity for cooperation between systems, etc. All

factors have a direct or indirect impact on various actors of regional development in the territory. Habánik (2007) considers the support of the sectors that account for the highest share of value added to be one of the most important factors of regional development.

3. METHODOLOGY

The paper addresses changes in the labour force structure in the regions of the Slovak Republic. It is necessary to investigate the changes over a longer period of time, so the comparison is done for 2000 and 2021. In addition to assessing the changes in the structure of the labour force and identifying the differences in the educational attainment structure of the labour force, the paper attempts to establish the relationship between educational attainment and the economic performance of the Slovak regions. Gross domestic product per capita is used to assess the economic performance of the regions.

Research work and professional publications of Slovak and foreign authors were used to write the theoretical framework of the issue. Statistical data were taken from the DATAcube database of the Statistical Office of the Slovak Republic. In addition to the time series analysis, the methods of comparison and synthesis were employed. The percentage of the labour force with the relevant educational attainment level in the total labour force is calculated and the dependence between the share of the labour force with a university degree and the performance of each region is determined.

4. RESULTS

In Slovakia, a long-term favourable trend can be observed in the evolution of the educational attainment of the population. It is true, however, that significant disparities between regions keep being present. Figure 1 shows the structure of the labour force or economically active population in the regions of the Slovak Republic in 2000 and 2021.
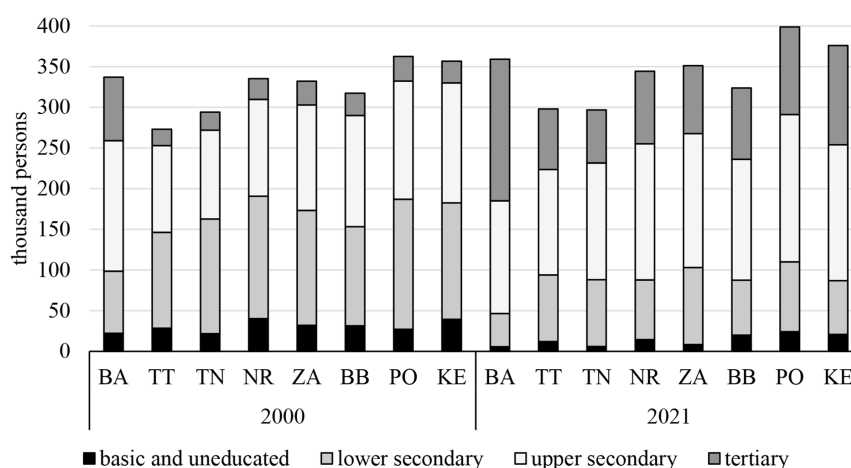
Legend: BA – Bratislava region, TT – Trnava region, TN – Trenčín region, NR- Nitra region,
ZA – Žilina region, BB – Banská Bystrica region, PO – Prešov region, KE – Košice region

Figure 1. Labour force structure by educational attainment
in the Slovak regions in 2000 and 2021
Source: Statistical Office of the Slovak Republic (2021)

As can be seen in Figure 1, the largest number of economically active persons was in the Region of Prešov (362.4 thousand) and the Region of Košice, followed by the Region of Bratislava, the Region of Nitra and the Region of Žilina in 2000. The least number of economically active persons was in the Region of Trnava (273 thousand persons). In the structure of the economically active population, upper secondary and lower secondary education prevailed.

In 2021, the situation was different. The number of economically active persons increased in comparison to 2000 in all regions. The largest labour force was in the Region of Prešov (398.9 thousand persons) and the gap between the Region of Prešov and Košice and Bratislava regions increased. The Regions of Trenčín and Trnava have the lowest number of economically active persons. In 2021, the structure of the labour force was dominated by complete secondary and higher education in the Region of Bratislava.

To better illustrate the comparison of educational attainment of the labour force, the percentage of economically active persons by educational attainment in each region was calculated, as shown in Figure 2.
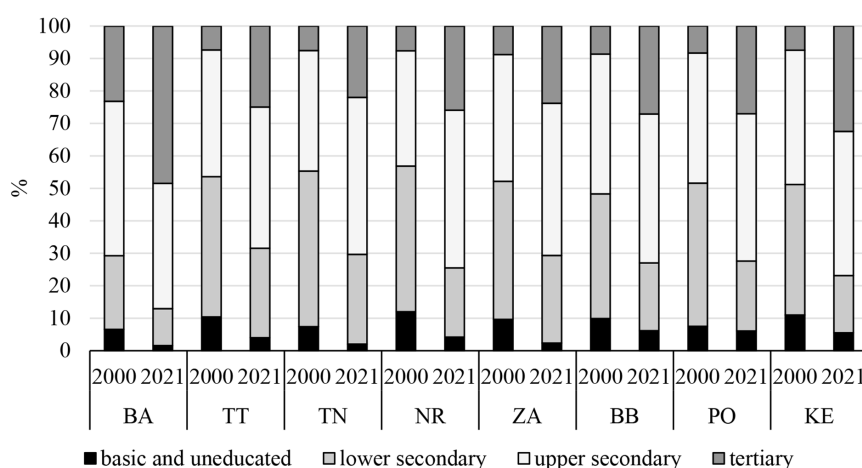
Figure 2. Proportion of labour force by educational attainment
in the Slovak regions in 2000 and 2021
Source: Statistical Office of the Slovak Republic (2021), own calculations

Figure 2 shows major differences in the structure of economically active persons in the regions of the Slovak Republic in 2021 compared to 2000. The highest share of economically active persons with tertiary education attainment was in the Region of Bratislava, namely 48.44% in 2021. The Region of Bratislava was followed by Košice Region with 32.47% of the workforce with tertiary education attainment in 2021. The Region of Trenčín, on the contrary, had a mere 21.97% of the workforce with tertiary education attainment in 2021.

Changes in the percentage of economically active persons in the Slovak regions in 2021 compared to 2000 were calculated. The results are listed in Table 1.

Table 1 shows a decrease in the share of the labour force with primary or no education in all Slovak regions. The largest decrease was recorded in the Region of Nitra. Similarly, the share of the labour force with lower secondary education decreased in all regions, most of all in Nitra, Košice and Žilina Regions. There was, however, an increase in the share of the labour force with full secondary education, with the exception of the Region of Bratislava, which saw a decrease

by almost 9 p.p. Major changes could be observed in the data related to workforce having tertiary education attainment. The highest increase in the share of the workforce with tertiary education was found in the Region of Bratislava and the Region of Košice, by more than 25 p.p. The smallest increase was recorded in the Region of Trenčín, a mere 14.42 p.p.

Table 1. Changes in the proportion of labour force by educational attainment in 2021 compared to 2000 (p.p.)

	BA	TT	TN	NR	ZA	BB	PO	KE
Basic and Uneducated	-5.00	-6.37	-5.36	-7.81	-7.30	-3.78	-1.44	-5.49
Lower Secondary	-11.30	-15.66	-20.28	-23.55	-15.56	-17.49	-22.56	-22.57
Upper Secondary	-8.98	4.46	11.22	13.07	7.86	2.84	5.28	3.04
Tertiary	25.28	17.61	14.42	18.26	14.98	18.43	18.67	25.02

Source: Statistical Office of the Slovak Republic (2021), own calculations

Since educational attainment has a significant impact on the economic performance of regions, the dependence of the share of the labour force with tertiary education attainment and the regional GDP per capita in the Slovak regions in 2000 (left graph) and 2020 (right graph) is illustrated in Figure 3. The data on regional GDP per capita for 2021 are not available, yet.
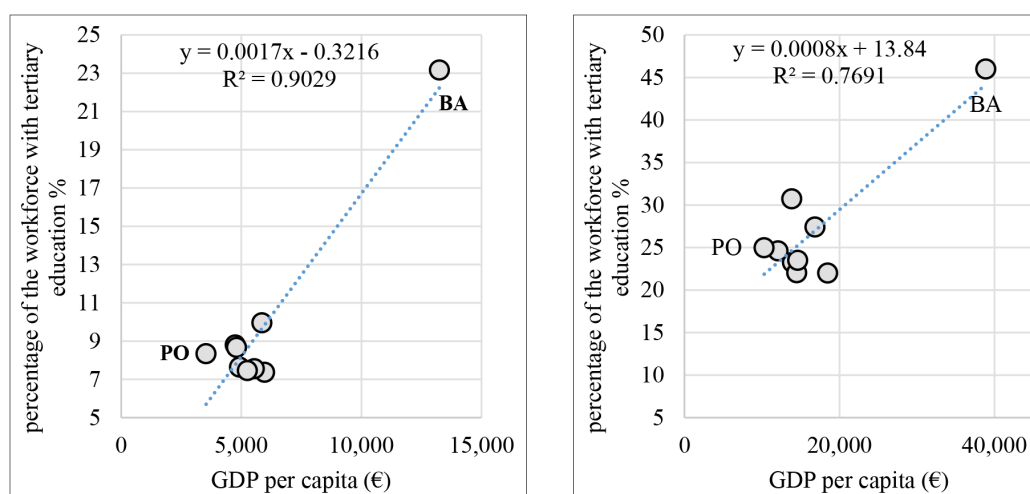
Figure 3. Dependence of the share of the labour force with tertiary educational attainment and the regional GDP per capita in the Slovak regions in 2000 and 2020

Source: Statistical Office of the Slovak Republic (2021), own processing

It was found that the share of people with tertiary education has a positive impact on regional economic performance. In 2000, the highest share of the workforce with tertiary education attainment and GDP per capita was found to be in the Region of Bratislava. The remaining regions follow by a wide gap, with minor disparities among them. The coefficient of determination (0.9029) shows a high dependence between the variables.

In 2020, both GDP per capita and the share of the workforce with a university degree were much higher than in 2000. A huge gap can again be seen between Bratislava Region and the remaining Slovak regions. The differences across other regions have slightly widened. The coefficient of determination decreased moderately (0.7691), and the value also indicates a high dependence between the variables.

5. CONCLUSION

Qualified human resources are essential in the process of knowledge creation and transfer into businesses and regions. Thus, human resources contribute considerably to the productive capacity of countries, which is a prerequisite for sustainable economic growth and global competitiveness.

The research findings indicate changes in the number of economically active persons between 2000 and 2021 in the Slovak regions. The changes were positive ones as the number of labour force grew. The biggest growth was recorded in the Region of Prešov. The lowest number of labour force had the Regions of Trenčín and Trnava. The changes also affected the structure of the labour force in a good way. In 2000, upper secondary and lower secondary education attainment prevailed in the structure of the labour force, whereas complete secondary education was dominant in 2021. In the Region of Bratislava, tertiary education attainment was prevailing in 2021, accounting for 48.44%. In 2000 and 2021, the share of the workforce with primary education or no education, and lower secondary education decreased in all Slovak regions.

A direct dependence was found between the share of the labour force with post-secondary education and GDP per capita in the regions of the Slovak Republic in 2000 and 2020. The highest proportion of the labour force with tertiary education attainment and the highest GDP per capita was in the Region of Bratislava. There is a wide gap between Bratislava Region and the remaining Slovak regions. There were no big disparities across the other Slovak regions, even though a slight increase in differences could be seen in 2020 compared to 2000.

We believe that educational attainment is just one of the factors having an impact on the value of human capital. Therefore, our further research shall be focused on a multi-criteria assessment of the human capital quality and identification of disparities across the Slovak regions.

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Human Resources Development in the Solution of Regional Disparities in Slovakia

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Abstract: *Different historical, geographical, socio-economic and social conditions have led to the situation that the regions in Slovakia are equipped with different start-up capital, different quality of human potential and various infrastructures and therefore they develop accordingly. Regional disparities are understood as differences in the degree of socio-economic development of regions, which is uneven. The problem of regional disparities cannot be seen only as economic differences between regions, as there are also significant intraregional differences within a region. In the regional context, education and training of youth and adults are directly linked to employment, social security, economic and social development. Insufficient education and training of individuals reduce their employment opportunities, limit their responsible approach to work and life, worsens living conditions, increases social risks, and may deteriorate their health. The level of educational attainment is also related to the level of innovation performance and the competitiveness of regions. A special area is represented by the preparation of capacities for the sector of research and development. The regional differences could be seen in the location of universities preparing graduates for research and development as well as the placement of research and development institutions. The main aim of the paper will be to point out how human resources could be deployed in the solution of regional disparities in Slovakia.*

1. INTRODUCTION

Since 2001, less developed regions in Eastern Europe have been catching up with the EU. However, many middle-income regions and less developed regions, especially in the south and south-west of the EU, are also suffering from economic stagnation or decline. Convergence between the Member States has accelerated, but internal regional disparities within fast-growing Member States have widened. Employment is growing, but regional disparities remain larger. The number of people at risk of poverty and social exclusion fell by 17 million between 2012 and 2019. Regional disparities as regards the innovation indicators have increased due to insufficient investment in research and development and weaknesses in the innovation ecosystems of the least developed regions.

The EU population is aging and the decline of the population is expected in the coming years. In 2020, as many as 34% of Europeans lived in a region with a declining population. It is assumed that in 2040 this share will reach up to 51%. Cohesion policy has a major impact on many regions and inhabitants in the EU. It helps to invest in more sustainable and balanced growth that has long-term benefits and impact. It supports physical and digital infrastructure, education and training, small and medium-sized enterprises and green deal transformation. More recently, cohesion policy has helped EU regions cope with the challenge of the coronavirus pandemic and its aftermath.

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Human potential is part of the socio-demographic potential of the territory. It is the basic carrier and the driving force of territorial development. Currently, regional development is marked by socio-economic instability, unemployment, the global economic crisis and the COVID-19 pandemic impact. The structure of the population is one of the basic demographic variables, which can be applied to predetermine demographic development and subsequent changes.

2.   METHODOLOGY AND AIMS

The paper is focused on the human resources in the regions of the Slovak Republic, recent trends in birth rate, aging, numbers of graduates of primary and secondary education, upper secondary education training, numbers of students enrolled in universities and the impact of graduates to the employment in regions, especially in the sector of research and development (R&D).

The paper aims to point out how human resources could be deployed in the solution of regional disparities in Slovakia. Specific aims include the comparison of trends in the birth and aging of population in Slovakia over the last ten years. Trends are reflected in the numbers of pupils attending secondary grammar schools and secondary vocational schools, and the numbers of students enrolled in universities. The university graduates could generally contribute to the economic progress of the country and provide added value to the economic performance in regions. However, over years, there has been a huge phenomenon of brain drain.

The statistical data were analyzed and assessed accordingly and results proceeded. Based on the recent census, statistical figures provided by the Statistical Office of the Slovak Republic and the European Statistical Office, the analysis of trends and the comparison among eight regions in the Slovak Republic were elaborated. The results have confirmed the regional differences from the aspect of relevant indicators, such as attained education, employment rate and unemployment rate, average age of teachers, share of adult population in productive age in adult education and professional education, investments into research and development, migration to more attractive regions with well-paid jobs and the exodus abroad.

The results permitted us to outline some conclusions and recommendations aimed at the betterment of human resources development in the regions.

3.   HUMAN RESOURCES IN THE REGIONS OF THE SLOVAK REPUBLIC

According to the census in 2021 in Slovakia, the ratio of men and women is relatively balanced. The state of the population as of 31.12.2020 is 5,459,781 inhabitants, out of which there were 2,793,295 women, which represents 51.16% of the total population, and 2,666,486 men, which represents 48.84% of the total population (Statistical Office of the SR. Population by Gender. 2022).

The number of inhabitants is inversely proportional to the area of NUTS 3 regions (Figure 1). Some regions, even if the largest in area, have a low number of inhabitants, which is best observed in the Banská Bystrica region. The uneven distribution of the population is largely related to demographic development but can be also ascribed to economic development.

Migration represents the movement of persons in geographical and societal space. The migration does not mean solely the movement of persons from one country to another, but also the movement and mobility of people between regions, which changes the number of inhabitants in regions.

In the Slovak Republic, internal migration represents the movement of the population from the eastern regions to the western regions, especially to the capital Bratislava. Based on this persistent trend, the number of inhabitants in individual regions has been changing (Table 2).
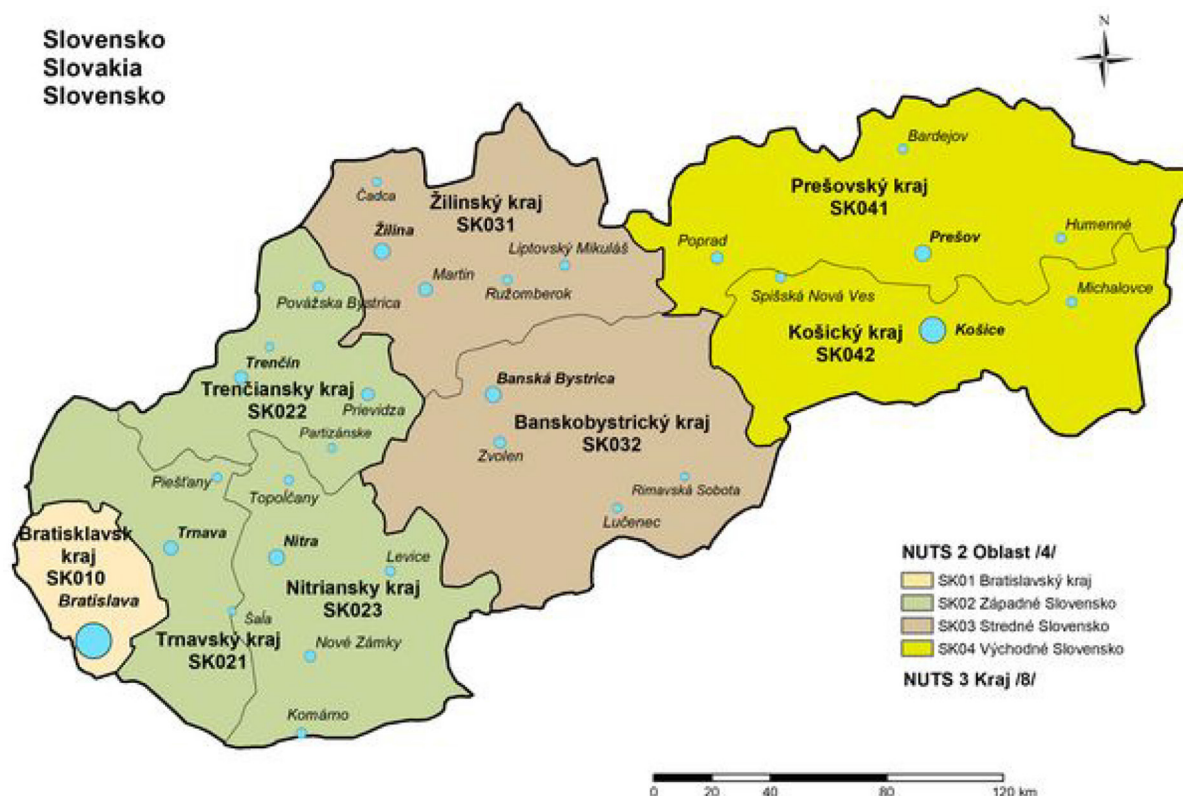
Figure 1. NUTS 2 regions in the Slovak Republic: Bratislava region, Western Slovakia, Central Slovakia and Eastern Slovakia

Source: https://www.czso.cz/csu/czso/slovakia-nuts

Table 1. Population in NUTS 3 regions in 2020

Region	Bratislava	Trnava	Nitra	Trenčín	Žilina	Banská Bystrica	Prešov	Košice	Slovak Republic
Population	677024	565324	582567	671508	691136	643102	827028	802092	5459781
Share in %	12,4	10,36	10,67	12,30	12,66	11,78	15,15	14,68	100
Area of the region in km²	2052,6	4146,3	6343,7	4501,8	6808,5	9454	8972,8	6754,3	49034

Source: Statistical Office of the Slovak Republic. Statistical Yearbook of the Regions in the Slovak Republic. 2020. p. 664.

Table 2. Development of the number of inhabitants in NUTS 3 regions of the Slovak Republic

Region	2012	2013	2014	2015	2016	2017	2018	2019	2020	Increase/ Decrease
Bratislava	612682	618380	625167	633288	641892	650838	659598	669592	677024	64342
Trnava	556577	557608	558677	559697	561156	562372	563591	564917	565324	8747
Trenčín	593159	592394	591233	589935	588816	587364	585882	584569	582567	-10592
Nitra	688400	686662	684922	682527	680779	678692	676672	674306	671508	-16892
Žilina	690121	690420	690449	690434	690778	691023	691368	691509	691136	1015
Banská Bystrica	658490	656813	655359	653024	651509	649788	647874	645276	643102	-15388
Prešov	817382	818916	819977	820697	822310	823826	825022	826244	827028	9647
Košice	794025	794756	795565	796650	798103	799217	800414	801460	802092	8067
Slovak Republic	5410836	5415949	5421349	5426252	5435343	5443120	5450421	5457873	5459781	48946

Source: http://datacube.statistics.sk/#!/view/sk/VBD_DEM/om7011rr/v_om7011rr_00_00_00_sk.

A high increase in the number of inhabitants is observed in the Bratislava region and Western Slovakia (especially the Trnava region) and Eastern Slovakia (the regions of Prešov and Košice). The comparison of the number of inhabitants in 2012 and 2020 in the Bratislava region shows an increase of 64,342 inhabitants. In contrast, the population decline is observed in Central Slovakia (namely the Banská Bystrica region) and the eastern part of Western Slovakia (the Nitra region).

The declining trend of the population in the above regions can be attributed to the interregional migration of persons searching for a better quality of life and job opportunities. In recent years, population decline has been shown in most regions. It was caused especially by low birth rates, rapid population aging and interregional migration, as the economically active population moves to regions characterized by a better quality of life chances and abundant job opportunities.

The balanced structure of the population can be ranked among the principal prerequisites for the development of the country. The overall development depends on the demographic structure of the population and the population aging. The phenomenon of aging is perceived globally, although the problem is more visible at the regional level. This aging affects the economic, societal and cultural aspects of social development. Each community tries to cope with the changes in the demographic composition of population policy. In 2013, the National Program of Active Aging for 2014 to 2020 was approved in Slovakia to help mitigate the negative consequences associated with demographic changes. The population policy should support, inter alia, the birth rate increase, middle age mortality decrease, and the integration of higher shares of immigrants. The general goal aims to create conditions for longevity in good health, strengthen the inclusion of elder persons in society and create conditions for a dignified life, enable the population to remain active in various areas (employment, volunteering), to take measures to eliminate discrimination based on age.

In Slovakia, in recent decades, significant demographic changes have been manifested, including population aging and the increase of older age population, with an impact on the whole society. While in 2011 the population aging index in Slovakia was 82.96%, in 2020 the index increased to 107.34%. Since the census in 2011, the share of the population over 65 years of age has grown significantly (Table 3).

Table 3. Population aging index in the Slovak Republic

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Index of aging (%)	82,96	85,51	88,34	91,17	94,22	96,96	99,43	101,90	104,80	107,34

Source: Statistical Office of the Slovak Republic, SODB 2021, Index of aging (Sauvy index) represents the number of persons in post-productive age (65+ years) per 100 persons in pre-productive age (0-14 years).

The share of the population in Slovakia in the pre-productive age from 0 to 14 years represents 15.90%, in the productive age from 15 to 64 years represents 67.03% and the share of the population in the post-productive age over 65 years represents 17.07%. While in 2011, the share of persons in pre-productive age (0-14 years) was higher than the share of persons in post-productive age (over 65 years), in 2021 the opposite is true (Table 4).

Table 4. Shares of the population due to the age composition in the Slovak Republic

	Year 2020 – Total
Share of persons in pre-productive age (in %)	15,90
Share of persons in productive age (in %)	67,03
Share of persons in the post-productive age (in %)	17,07

Source: Statistical Office of the SR, Census 2021

4. HUMAN POTENTIAL IN REGIONS

The basic priority in human resources development is the education of the young generation. Education is the most important component of human capital development. It can be considered the main factor affecting the overall development in regions. The education in secondary schools, the education and training in secondary vocational school and the study at universities are basic instruments for capacity building referring to the competitiveness of regions.

Table 5. Number of pupils at grammar schools in the regions of the Slovak Republic

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	Increase/ Decrease
Slovak Republic	80346	76711	74524	73757	72287	73880	72842	72755	70675	-9671
Bratislava region	13388	13275	13166	13430	13210	14009	14373	14430	14639	1251
Western Slovakia	21779	20558	19619	19549	19150	19395	19048	18660	18670	-3109
Trnava region	6713	6388	6222	6069	6025	6190	6039	5955	6044	-669
Trenčín region	6981	6636	6126	6415	6334	6369	6274	6142	6150	-831
Nitra region	8085	7534	7271	7065	6791	6836	6735	6563	6476	-1609
Central Slovakia	19929	18807	18193	17696	17355	17630	17152	18381	16491	-3438
Žilina region	11593	11061	10714	10438	10217	10353	10133	9802	9594	-1999
Banská Bystrica region	8336	7746	7479	7258	7138	7277	7019	8579	6897	-1439
Eastern Slovakia	25250	24071	23546	23082	22572	22846	22269	21304	20875	-4375
Prešov region	13045	12318	11902	11633	11329	11428	11151	10730	10447	-2598
Košice region	12205	11753	11644	11449	11243	11418	11118	10574	10428	-1777

Source: datacube.statistics.sk.

According to Table 5, there has been an increasing trend in the number of students at grammar schools in the Bratislava region, which is the most economically developed region with the most economically active population. In contrast, a decreasing trend in the number of pupils at grammar school is characteristic of other regions of Slovakia. The trend could be attributed to the lower birth rate in given age cohorts of pupils and the lower interest of pupils to attend secondary grammar schools as graduation from this type of secondary school presupposed enrolling in university study. There might also be some other reasons, especially the limited number of universities in NUTS 3 regions, except the Bratislava region, and the lower economic status of families.

Table 6. Number of pupils at secondary vocational schools in the regions

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	Increase/ Decrease
Bratislava region	13605	12708	12383	12132	12428	12442	12522	12856	13313	-292
Western Slovakia	55976	52402	49860	47608	45694	43821	42033	40471	40253	-15723
Trnava Region	17447	16537	15724	14416	13970	13437	12772	12355	12257	-5190
Trenčín region	17999	16447	15549	14763	13896	13118	12556	12005	11908	-6091
Nitra region	20530	19418	18587	18429	18728	17266	16705	16111	16088	-4442
Central Slovakia	41836	39765	37956	37003	35700	34534	33393	32126	32024	-9812
Žilina region	24099	22767	21719	20992	20090	19332	18609	17970	17939	-6160
Banská Bystrica region	17737	16998	16237	16011	15610	15202	14784	14156	14085	-3652
Eastern Slovakia	46539	43873	42600	41617	40332	38845	37127	36758	37066	-9473
Prešov region	25193	23466	22419	21482	20787	20299	19329	18724	18752	-6441
Košice region	21346	20407	20181	20135	19545	18546	17798	18034	18314	-3032

Source: datacube.statistics.sk

Table 6 referring to the numbers of pupils in secondary vocational schools in the regions presents a different trend than Table 5 (secondary grammar schools). In all regions, including the Bratislava region, the number of pupils in secondary vocational schools has been falling. The

decrease in the Bratislava region has been minimal, in comparison with the rest of the country. The decreasing trend is expected also in the coming years. The decreasing quantity should be replaced by increasing quality. The human capital development in the regions will thus depend on the creative and innovative activities of young people and their adequate adaptation to the requirements of labor markets in the regions. The graduates of secondary schools in general represent an age cohort where university applicants are concentrated.

The above observations correspond with the number of students at universities (table 7). Highly competitive regions are based on the knowledge and work capacity of persons who are able to adapt to changes in professions and life and are interested to develop and supplement their education in different ways and forms.

However, the number of students at universities in the Slovak Republic has been decreasing over the monitored years (2014-2020). It must be admitted that literacy, attained education and educational level representing the driving force of the population's economic activity has not been developing in accordance with the general requirement, trends, political expectations and regional requests. The quality of teachers is considered basic factor determining the quality of education and training. The results of the OECD international survey have shown that the average age of teachers in Slovakia is 44 years, with 82% of women. The share of teachers under the age of 30 is only 8.2%. The wish to work in the sector of education as a teacher has been diminishing as the graduates of teacher training universities prefer other professions. Therefore, there is no surprise that the age of teachers in Slovakia is increasing as there is limited renewal of teaching staff.

Another negative tendency is the exodus abroad of persons in productive age. Some 300.000 persons under 30 years of age have already left Slovakia by 2020, with the largest share of university graduates. The possible return would require specific measures, among other the availability of rental housing for young people and their families, as well as the availability of relevant jobs. Generally, young families would necessitate relevant allowances during parental leave (with the aim of economic stability) and subsequent professional growth and performance (Vision and Strategy of Development of Slovakia by 2030, 2019).

Table 7. Number of students at universities in the regions of Slovakia

Year	2014	2015	2016	2017	2018	2019	2020	Increase/ Decrease
Bratislava region	59254	52803	54470	34863	48270	47404	50277	**-8977**
Western Slovakia	41105	37821	34778	27828	27984	26713	28295	**-12810**
Trnava region	15876	14801	14260	10149	10138	9950	10869	**-5007**
Trenčín region	6043	5064	3736	2545	4047	3648	4413	**-1630**
Nitra region	19186	17956	16782	15134	13799	13115	13013	**-6173**
Central Slovakia	29320	26168	24611	18270	19729	25419	20301	**-9019**
Žilina region	15252	13445	13138	10055	10578	16763	11312	**-3940**
Banská Bystrica region	14068	12723	11473	8215	9151	8656	8989	**-5079**
Eastern Slovakia	30618	28248	28785	21322	22114	21583	23016	**-7602**
Prešov region	10346	9928	10173	7359	7486	7329	7682	**-2664**
Košice region	20272	18320	18612	13963	14628	14254	15334	**-4938**

Source: http://datacube.statistics.sk/#!/view/sk/VBD_DEM/om7011rr/v_om7011rr_00_00_00_sk.

The comparison of results in 2011 and 2020 concerning the education of the population aged 15 – 64 has shown the decreasing tendency in persons who completed lower than primary education,

primary education, secondary education and post-secondary non-university education. An increase was recorded solely in persons aged 15-64 who completed tertiary education (Table 8).

Table 8 includes the comparison between 2020 and 2011 from the aspect of other significant indicators of the education in Slovak population. The number of university graduates decreased significantly compared to 2011 and 2020. The share of the adult population aged 25-64 who participated in lifelong learning or professional education and training decreased in 2020 compared to 2011 as the share of men in 2011 was 3.5%, of women 4.6%; the share of men in 2020 decreased to 2.6% and of women to 3.0%.

Table 8. Education of the population in the Slovak Republic - comparison of 2011 & 2020

Indicator	2020		2011	
	women	men	women	men
Population (age 15-64) with completed lower than primary education, primary education or lower secondary education, in % (ISCED 2011, level 0-2)	14,9	12,5	19,7	14,6
Population (age 15-64) with completed upper secondary education and post-secondary non-university education, in % (ISCED 2011, level 3-4)	59,1	68,2	63,2	71,0
Population (age 15-64) with completed tertiary education, in % (ISCED 2011, level 5-8)	26,0	19,2	17,1	14,4
Adult population (age 25-64) with minimum upper secondary education, in %	92,0	93,3	89,3	93,3
Young population (age 20-24) with minimum upper secondary education, in %	89,2	90,1	94,0	92,6
Share of early school leavers from vocational education and training (age 18-24) in %	7,4	7,7	4,6	5,4
Graduates from I level and II level of university study	21 779	13 585	44 900	25 078
Graduates of III level of university study - doctoral study (post-graduate study)	662	639	847	825
Total share of university graduates in %	61,2	38,8	63,8	36,2
Share of adult population (age 25-64) who participated in long-life education or professional training in %	3,0	2,6	4,6	3,5

Source: Statistical Office of the Slovak Republic. Census 2021.

In 2020, 7.4% of women and 7.7% of men aged 18-24 made up the share of people with early termination of education and training which is a significant increase compared to 2011 (Table 9). In 2020, 7.6% of the population (both men and women) early left education and training, which is rather an increase compared to 2011, when it was 5.1%, out of which the share of working people in 2020 was 1.5% and the share in 2011 was 1.3%.

Table 9. Early school leavers from vocational education and training

	Indicator	2020	2011
	Population total (in %)	7,6	5,1
Number of persons (aged 18-24)	Working population (in %)	1,5	1,3
	Unemployed population (in %)	6,1	3,8
	Economically inactive persons who want to work (in %)	2,4	2,5
	Economically inactive persons who do not want to work (in %)	3,7	1,3

Source: Statistical Office of the SR. Census 2021.

The share of the unemployed in 2011 was 3.8% and it increased significantly to 6.1% in 2020. The share of economically inactive persons who want to work reached 2.4% in 2020, which remained almost unchanged compared to 2,5% in 2011. The comparison between 2011 and 2020 in economically inactive persons who do not want to work increased significantly from 1.3% to 3.7%.

4.1. The Level of Attained Education

The share of the population aged 15 to 64 who attained pre-primary education, primary education and lower secondary education was 13.5% in 2020, the share of people aged 15 to 64 who

achieved upper secondary and post-secondary education was 62.5% and of persons aged 15 to 64 who attained tertiary education was 23.9%.

In 2020, more men than women attained higher secondary and post-secondary education in the Slovak Republic, and on the contrary, more women attained tertiary education. Pre-primary, primary and lower secondary education was approximately at the same level for men and women.

In 2020, a total of 2.8% of population aged 25 to 64 participated in adult education and professional training in the Slovak Republic, of which 2.6% were men and 3% were women. Compared to the European Union, where the level of adult education was 9.2%, the Slovak Republic lags behind significantly (Eurostat, 2021).

4.2. Unemployment in the Slovak Republic and the Unemployment Rate in the EU

The unemployment rate represents unemployed persons as a percentage of the labor force. As of December 31, 2021, there were 200.225 unemployed citizens in the Slovak Republic, which represents a 6.76% unemployment rate. In Slovakia, for a long time that was the lowest unemployment rate has been monitored in Western Slovakia, mainly due to the high number of job opportunities. The unemployment rate increases persistently in the east of Slovakia (Table 10). The most unemployed were in the Prešov region with a share of 10.75%, followed by the Košice region with a share of 9.98% and the lowest share was in the Trnava region with 4.16%.

Table 10. Unemployment in the Slovak Republic as of 31 December 2021 by regions

	Number of unemployed persons	Unemployment rate
Slovak Republic	200225	6,76%
Banská Bystrica region	32137	9,01%
Bratislava region	16027	4,38%
Košice region	40788	9,98%
Nitra region	18436	4,80%
Prešov region	45574	10,75%
Trenčín region	14009	4,28%
Trnava region	13061	4,16%
Žilina region	20193	5,32%

Source: Statistical Office of the Slovak Republic. 2022.

More job opportunities and a higher educational level of the population are confirmed in Western Slovakia, as the highest proportion of residents with higher education live in the Bratislava region. On the other hand, Bratislava Region has the lowest share of residents with attained primary education. The situation in the Bratislava region confirms that the development of human resources in terms of competitiveness should focus on adult education and further vocational and professional education and training, as progress should be triggered and accompanied by capacity building in regions.

At the end of 2021, the unemployment rate decreased both in the Eurozone and the European Union as a whole, as the demand for labor force started to increase again. According to data from Eurostat, in 2020 there were 15,808,000 unemployed persons in the European Union, in 2021 the number of unemployed people fell to 13,612,000.

According to the Eurostat data, the unemployment rate in the euro area decreased to 7% in December 2021 compared to 8.2% in December 2020. The unemployment rate across the EU

decreased to 6.4% in December 2021 compared to 7.5 % in December 2020. In December 2021, 13.612 million men and women were unemployed in the EU, of which 11.481 million were in the Eurozone.

As regards the persons under the age of 25, as many as 2.748 million persons were unemployed in the EU, out of which 2.222 million lived in the euro area. In December 2021, the unemployment rate of people under the age of 25 reached 14.9% in the EU and the Eurozone. This means a decrease from 15.3 % in November 2021 in the EU and 15.4% in the Eurozone.

4.3. Science, Research and Innovation in Slovakia

The prerequisites for a high-quality level of science and research are two factors - a qualified and educated team of researchers and a sufficient volume of invested funds. Both factors can be considered the initial impulses supporting the innovativeness of the country. These factors influence each other, because without sufficient funding it will not be able to retain high-quality researchers, and without high-quality human capital, there will be no willingness to invest in research and development.

The connection between research, development and innovation on one side and a prosperous economy on the other side can be observed on a global level. On a global scale, there is competition between the US, the European Union and China in terms of investment in research and innovation in relation to GDP. Every year, China pours investments into research and development, trying to become a global leader.

In 2020, Belgium became the leading country within the European Union, sharing first place with Sweden. Both Belgium and Sweden invested 3.5% of their GDP in research and development (R&D). Slovakia and the other five new EU Member States (Bulgaria, Cyprus, Latvia, Malta, and Romania) found themselves at the opposite end of the ranking. Table 11 shows the values of Slovakia in terms of the percentage of GDP.

Table 11. Investments in research and development in Slovakia as a % of GDP

Year	2014	2015	2016	2017	2018	2019	2020
Investment in R&D as % of GDP	0,88	1,16	0,79	0.89	0.84	0.83	0,92

Source: EUROSTAT

The Slovak Republic had set a goal to invest 1.8% of GDP in research by 2020. Table 11 includes investments in research and development in relation to GDP, showing that the Slovak Republic failed to meet this target. The investments increased only by 0.13% of GDP from 2016 to 2020. In 2015, investments rose above 1% of GDP, but this was a consequence of the EU structural funds intended for the Slovak Republic.

From the point of multi-source financing of research and development in the monitored period, the biggest share of financing originates from business and state sources.

It is obvious that Slovakia has obvious shortcomings from the aspect of multi-source financing of research and development. The average share of investments from state resources in the European Union is around 29%, while the share of this type of investment in Slovakia represents around 40%. In the new member states, the EU structural and investment funds may be one of

the reasons for the low share of private resources. In some countries, these funds are insufficiently implemented, which also is the case in Slovakia, where in 2020 these funds represented 14.28%.

The Bratislava region is the smallest region within the NUTS 2 regions in Slovakia, but it spends the highest share of funds on research and development. For the year 2020, the value of invested financial resources in Bratislava region is more than doubled when compared to Western Slovakia, the second in the ranking. Compared to Eastern Slovakia, the difference is more than threefold. For the year 2020, the financial support for research and development in the Bratislava region reached 393.853.000 euros, thus surpassing the highest value of investments in 2015. The leadership of the Bratislava region can be attributed to several factors, among others, that Bratislava is the capital and largest city of Slovakia with the concentration of most researchers and most research institutions in Slovakia.

It is paradoxical, that in Eastern Slovakia with the second largest city Košice the rate of funding of research and development is at the lowest level when comparing all eight NUTS 3 regions are compared. This is also reflected by the departure of a number of young qualified people from Eastern Slovakia to Western Slovakia, especially to the Bratislava region or abroad. The region of Eastern Slovakia has long been considered unattractive for domestic and foreign investors, who prefer other EU countries or regions in Western Slovakia when expanding their business. The reason may consist of insufficient infrastructure or inappropriate conditions for retaining and developing talents. In this regard, the Slovak government must help balance regional differences in research and development.

According to the data of the Slovak Statistical Office, Western Slovakia is the region with the largest number of enterprises. The majority of small and medium-sized enterprises are located here, and the business sector is the largest source of funding for research and development in this region. On the contrary, the least funds flow from private non-profit organizations, which have the lowest representation in the other regions as well. The governmental sector provides this region the lowest contribution compared to other Slovak regions.

The Bratislava region was the most supported region from governmental resources in 2020 when governmental finances made up almost half of the total resources. The Bratislava region is the region with the second highest number of small and medium-sized enterprises and the highest number of large enterprises; however, the funding support for research and development by this sector is the lowest among the Slovak regions, at the level of 30.97%. A significant share of funds comes from foreign sources. Foreign investors have been considering the Bratislava region the most attractive within Slovakia, therefore they have concentrated in this region.

In Central Slovakia, the ratio of finance from business and governmental resources is relatively balanced. Financial resources spent in these sectors are around 41%. A relatively high percentage of resources came from universities.

There are seven universities in Central Slovakia, but there are eleven universities in the Bratislava Region. If funding is compared, Central Slovakia spends three times more funds compared to the Bratislava Region. In the Bratislava Region, private non-profit organizations participate in the support of R&D to the highest extent among the regions.

Eastern Slovakia invests the least funds in R&D. The structure of funding in Eastern Slovakia mainly comes from business and governmental sources. A relatively high share, almost 17%, comes from foreign sources, which is only 1% less than in the Bratislava region.

In the territory of Slovakia, the field of technical sciences received the largest share of the total funds provided. The main content of technical sciences is research in the field of technical systems, their analysis and prediction of the development of new processes and objects. This group includes a whole range of industries, such as construction, engineering, information and communication technologies, and electrical engineering. These sectors are the most represented in Slovakia, therefore this area is financed to the greatest extent. The largest amount of funds invested in technical sciences was identified in Western Slovakia. The second most supported scientific field in Western Slovakia is agriculture, with a key impact on the quality of life.

The natural sciences include sciences such as mathematics, physics, chemistry, biology, and many other sciences that deal with the functioning of the Earth. In 2020, this scientific area was the most funded in the Bratislava region, which has nine faculties focusing on natural sciences, which is the most among the monitored regions. A significant volume of funds was allocated to technical sciences. Medical sciences, together with social sciences and humanities are significantly more represented in comparison with other regions. The least supported scientific area in the Bratislava region were agricultural sciences.

As in the majority of the monitored regions, also in Central Slovakia, the field of technical sciences is financed the most. Compared to other scientific areas in this region, technical sciences exceed them by ten times on average. Humanities in Central Slovakia received the lowest financial support. The presence of the Faculty of Medicine in Martin may be the reason that the medical sciences with priorities such as human health, diagnosis and treatment of diseases, were the second most funded area.

In Eastern Slovakia, the least financially subsidized region, technical sciences attracted attention with the share of financial support. In the area of natural sciences, the funding was of the second highest amount preceded by the Bratislava region. Other scientific fields were funded at approximately the same level.

The funding of research and development is directly related to the human resources employed in R & D. According to the Eurostat database, the number of researchers in the European Union has been increasing. The total number of researchers in Slovak regions has been increasing annually. In 2020, the number represented 22,404.6 FTE equivalent. Both sexes were represented among the researchers, but male representation prevails, at approximately 61%.

In 2020, 45.6% of researchers in Slovakia were concentrated in the higher education sector. The second most represented sector was the business sector (35.9%). The governmental sector has employed 4,127 researchers (18.4%). The least represented was the non-profit sector, with as little as 0.05% of the total number of researchers. The total of employees in all R&D branches in Slovakia represented 0.81% of the total workforce. The average of the European Union is at the level of 1.44%. Slovakia thus placed itself below the EU average, while at the same time showing the worst results in the V4 grouping. The Czech Republic, as the only V4 country with a share of 1.54% of the total labor force in R&D, exceeded the European average.
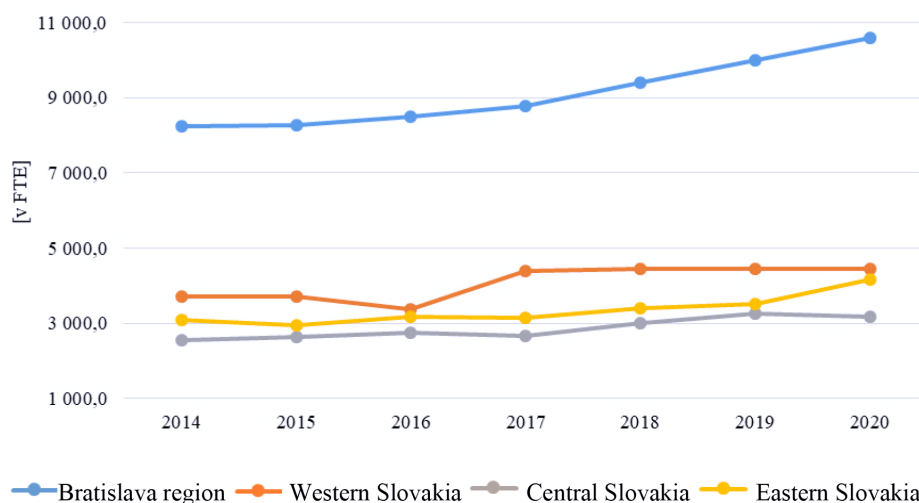
Figure 2. Development of the number of employees in R&D in the NUTS 2 regions
in 2014-2020 [in FTE- full-time equivalent in person-years]
Source: Yearbook of science and technology of the Slovak Republic

The Bratislava region has been making significant progress compared to other NUTS 2 regions. For the monitored period 2014 – 2020, the number of R&D employees in FTE equivalent was growing continuously, while the highest number of employees (10,588.8) was located in the Bratislava region in 2020. The second place with the highest number of employees was taken by Western Slovakia. At the turn of 2016-2017, after a slight decline growth occurred, and 4,396 employees worked in R&D. Subsequently, a stagnation started, and from 2016 to 2020 only 56 workers had been added.
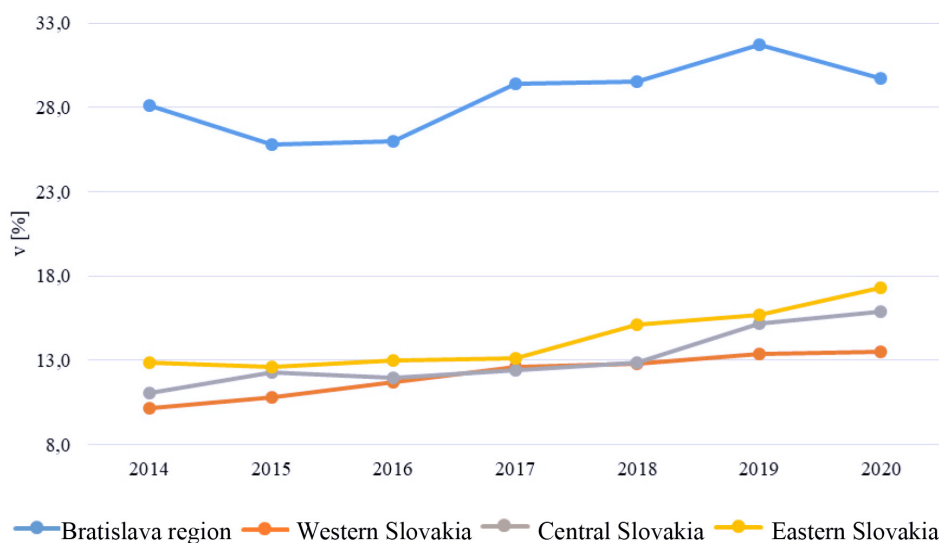
Figure 3. Human resources in science and technology (HRST)
in NUTS 2 regions 2014 – 2020 [in %]
Source: Eurostat

In Eastern Slovakia, the number of employees in R&D did not vary significantly during the monitored period. In 2017, a visible slight increase in the number of R&D employees began, and in 2020 it crossed the threshold of four thousand employees for the first time, bringing it closer to the level of Western Slovakia.

During the monitored period, Central Slovakia has been the region with the lowest share of R&D employees. The highest number in the region was recorded in 2019 (3,255.3). In 2020, there was a decrease in the number of employees (3,187.4).

Human resources in science and technology (HRST) consist of persons who successfully graduated from III level of university education or persons who have been working in science and technology in spite they did not graduate from the III level of university education.

Figure 3 demonstrates the percentage of the human resources employed in science and technology from the total workforce in the NUTS 2 regions. The leading region is the Bratislava region, mainly due to the high concentration of HRST in this region. The second highest percentage of human resources in science and technology is located in Eastern Slovakia.

Most probably the technical universities located in Bratislava and Košice have been an attractor for HRST. In 2017, Western Slovakia, Central Slovakia and the Eastern Slovakia regions achieved almost the same level of employment of HRST. The Bratislava region was ranked above the EU average, however from an overall aspect, Slovakia was placed on the lowest ranks and the percentage of HRST in the total workforce is at the level of 17.3%.

When Slovakia would like to maintain and promote a high-quality workforce in R&D, it is necessary to set up more suitable conditions for future employees even during their university studies. The lack of researchers in Slovakia has been caused by the neglect of education funding in recent years. This resulted in a situation where a large number of smart students had decided to depart abroad for a better life and work conditions. Unfortunately, they do not utilize the acquired knowledge and skill in favor of the R&D in the home country.

5.   FUTURE TRENDS IN RESEARCH

Future trends in research should focus on aspects linked to the deployment of human resources in regions. The deployment of secondary school leavers and university graduates qualified for the requirements of regional labor markets is not fully utilized as a relatively high percentage of them migrate to regions with better quality of life levels and well-paid job opportunities, some of them leaving the country and search jobs abroad. The employment rate differs between regions and within the regions. The essential factors such as the necessity to innovate educational processes and the preparation of the R&D sector staff should be highlighted.

The necessity to innovate educational processes in Slovakia is also visible on the example of other EU Member States. The EU countries, following the path of education upheaval and transformation, have been producing a large number of experts, spending incomparably more funds on R&D, and are thus generating suitable conditions and environments in order to retain university graduates. Countries investing huge amounts of funding in innovation, research and development have started to strengthen a more prosperous and competitive economy.

The further development of vocational education of employees at productive age is mainly influenced by the requirements of employers in the labor market. The criterion of success and effectiveness of adult education is assessed and measured in terms of "become a successful applicant in the labor market." It should be probably changed to the criterion of "be employed as a successful applicant with knowledge and skills that could be transposed to related professions".

Another problem that Slovakia has been facing, and which cannot remain unnoticed in the future, is a certain imbalance between the demand from companies and the supply of graduates. In terms of innovative activities, the Slovak labor market is still not sufficiently prepared for industrial revolution 4.0.

The problem of regional disparities cannot be seen only as economic differences between regions, as there are also significant intraregional differences within a region. Regional differentiation in Slovakia has been increasing over the last 30 years and has reached a level known as regional polarization or regional disparities. Neither the funding from EU structural and investment funds could have reduced the economic and social differences since 2004. The research should focus on the assessment of the benefits of EU funds in relation to the development of human capital regions.

6. CONCLUSION

Trends are reflected in the numbers of pupils attending secondary grammar schools and secondary vocational schools, and the numbers of students enrolled in universities. The university graduates could generally contribute to the economic progress of the country and provide added value to the economic performance in regions. However, over years, there has been a huge phenomenon of brain drain.

We consider the human potential in regions the most important factor in the sustainable growth of regions in Slovakia. Employees of productive age deserve special attention from their employer, especially the vocational training, and acquisition of necessary knowledge and skills, including digital skills.

However, vocational adult education is mainly influenced by the requirements of employers in the labor market. The criterion of success and effectiveness of adult education is assessed and measured in terms of "become a successful applicant in the labor market." A special problem in Slovakia is represented by the digital skills of adults and the ability to solve problems in the IT environment. The digitization index (DESI index) in the human capital component contains an indicator for the rate of basic skills in the population aged 16-74, where Slovakia reaches a level below the EU average. The acquisition of basic digital skills are essential for further education (e.g. online courses), effective involvement of citizens in the functioning of the state (e-government, e-health) and self-governing regions and prevention of further marginalization of vulnerable groups.

These disparities are also caused by the fact that graduates do not meet a certain level of expertise and skills, required by an employer. As a result, employers consider graduates unattractive and start headhunting persons demonstrating high-level quality expertise and skills. This causes inequality in the labor market, which results in the unemployment of graduates. With the onset of the 4.0 industrial revolution, the problem will refer to the expertise and skills of graduates as well as to digital skills which will be considered "a cornerstone" of digitization.

Industry 4.0 requires radical changes in education and industry. Technological knowledge and skills are important factors in the industrial revolution 4.0. With this in mind, different qualification requirements will be demanded from graduates. Above all, it is necessary to emphasize mathematics, informatics, analytical and critical thinking. This is the reason why in the near future the education ought to be changed in Slovakia and students should be developed in the above knowledge and skill, promoting the graduates to become attractive on the labor market, showing

the adaptability to requirements of newly arisen professions and jobs. Greater emphasis on the innovativeness of teaching should be put in the foreground of the governmental policy of education. New challenges have been demonstrated by new professions in the era of industry 4.0.

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Relationship between Ethics, Rule of Law and State Leadership

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Abstract: The study of what is ethically good and bad, as well as what is morally correct and wrong, is known as ethics, also known as moral philosophy. A moral value system or theory is commonly used to refer to any system or theory of moral values or principles. Individuals who lead ethically act in accordance with a set of principles and values that the majority recognizes as a sound foundation for the common good. Integrity, respect, trust, fairness, transparency, and honesty are among them.

Integrity is a crucial determinant of trust and a crucial concept for an understanding of governance. Ethics and state leadership policies should be focused on eliminating corruption and establishing strong ethical standards, which will serve to strengthen the credibility and legitimacy of people participating in state decision-making while also protecting the public interest.

This paper will analyze the role of personal ethics in leadership and how ethics helps people become more effective leaders. Understanding ethics, integrity, and motivation in order to act as a role model and build a plan of action for state leadership will be discussed, as well as the value of excellent leadership.

1.   INTRODUCTION

> "The supreme quality for leadership is unquestionable integrity. Without it, no real success is possible." – Dwight Eisenhower

According to history, the interest in leadership ethics is not a new phenomenon, People have always been interested in the ethics of leaders because, like it or not, leadership matters since it has the capacity to dramatically help or hinder people's well-being. This is due to the fact that leadership is an essential component of the human experience and how we live and work together. History and philosophy shed light on the subject by revealing certain patterns of leadership behavior and themes about leadership and morality that have existed throughout history. They serve as a reminder that some of the most fundamental issues concerning the nature of leadership are inextricably linked to the human condition (Ciulla, 2018, p.303).

2.   UNDERSTANDING THE WORDS *ETHICS* AND *MORALITY*

To really comprehend ethical leadership, it is necessary to first define the concepts of ethics and morality. Some people like to distinguish between these two concepts, stating that ethics is related to society ideals and morality is related to personal values. In practice, moral philosophy courses cover the same material as ethics courses. Regardless of their origins in different languages, these terms have a long history of being used interchangeably (Ciulla, 2020, p.5).

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In the online *Merriam Webster Dictionary* the word *moral* is defined as "of or relating to principles of right and wrong in behavior: ethical moral judgments", "expressing or teaching a conception of right behavior", "capable of right and wrong action" and the term *ethics* very similar to the term moral, is defined as "involving or expressing moral approval or disapproval *ethical* judgments" or **"**conforming to accepted standards of conduct *ethical* behavior" (Merriam Webster Dictionary).

To summarize, morality and ethics are concerned with what is right or wrong, good or terrible. They are about values and standards that people care deeply about because there are important interests at stake that influence the community of which they are a part. Values and standards serve as the foundation for judgment and decision-making. However, the responsibilities they serve are distinct. A "value" is a notion or attribute that helps us make decisions about what is good, right, attractive, or praiseworthy. Thus, values influence individual and societal action choices. (Huberts, 2018).

The study of ethics and the history of ideas assist us in understanding two overarching and overlapping questions that drive the major part of leadership research. They are as follows: What is leadership? And what exactly is good leadership? One is a question about what leadership is, and the other is a descriptive question. The other is a normative question about what leadership should be. In the literature, these two questions are sometimes mixed up. The ability of scholars in the field to integrate the answers to these questions is critical to the advancement of leadership studies. American philosopher, Joanne Ciulla says that "the moral triumphs and failures of leaders carry a greater weight and volume than those of nonleaders." The study of ethics is concerned with human relationships. It is about what we should do and how we should act as human beings, members of a group or society, and in the various roles, we play in life. It is about what is right and wrong, what is good and what is evil. Leadership is a special kind of human relationship. Power and/or influence, vision, obligation, and responsibility are some attributes of this relationship (Ciulla, 2018, p.302).

History is replete with leaders who did not believe they were held to the same moral standards as the rest of society in terms of honesty, propriety, and so on. One explanation is so obvious that it has become cliché: power corrupts. The first and most obvious feature of the power-virtue relationship is that leaders typically have more power or a different type of power and influence than followers. A leader's position, expertise, personality, or charisma can all provide him or her with power. Leaders use persuasion, personal or political networks, coercion, or rewards to influence others. Power has the potential to cause a slew of ethical quandaries, ranging from what it is used for to how it is wielded. The more power leaders wield, the more accountable they are for what they do and do not do.

Consider, for example, Plato's 'Ring of Gyges.' When given a ring, a shepherd named Gyges becomes invisible. The story literally and figuratively raises the transparency question: would you be moral if you had the power to be invisible? Plato's 'Ring of Gyges is telling a story of how a just man if given a ring that makes him invisible starts to act unjustly with no fear of reprisal. Would you be moral if no one was watching? Leadership is slightly like having the ring of Gyges. No one can deny, that even the justest man would behave unjustly if he had this ring (Plato, 1992).

3. THE RULE OF LAW AND LEADERSHIP

The rule of law is a crucial political moral ideal. It is, however, solely one of many principles, such as sovereignty and human rights, social fairness and social protection, economic freedom, or democracy. The rule of law literally means that the law should govern. Everyone is obligated to obey it, and everyone is held accountable to it: the law is the supreme authority. The rule of law tries to limit and restrain political power by making the government and official authorities accountable to the law. General, explicit, and relatively consistent norms must be used to implement the state's political acts and actions (Deinhammer, 2019).

People in a rule-of-law state can rely on the fact that political action is bound by promulgated, future, and relatively unchanging laws. As a result, politics becomes more predictable. One can predict how the state will react to one's own decisions and actions. This element of predictability is essential for making long-term planning and developing a life strategy. According to this viewpoint, the rule of law, as Hayek pointed out, is beneficial to individual and economic liberty (Hayek, 1960).

4. TOWARDS A DEFINITION FOR INTEGRITY

Integrity is paramount in leadership. A discussion paper from the Smith School of Business Centre for Social Impact written by Katheryn Christie and Kehoe Fellow found out that a consistent theme in the downfall of the many senior leadership executives who have been in the media for scandal and illegal activity has been their lack of integrity and their inability to lead according to a moral set of values. For years, the definition of integrity has been hotly debated in theory and practice. The definition of integrity is beginning to take shape as researchers and practitioners work to bridge the gap between Merriam-Webster and what happens in practice (Christie & Fellow, Smith School of Business Centre for Social Impact).

Merriam-Webster defines integrity as: "a firm adherence to a code of especially moral or artistic values". Integrity is much more than a value. Values, as a essential components of successful leadership are defined by Merriam-Webster as "a person's principles or standards of behavior and one's judgments of what is important in life" (Choi & Wang, 2007).

With this knowledge, we can consider integrity to be the missing piece of the puzzle that gives meaning to one's values. It is one thing to have a strong set of core values as a leader, but it is quite another to have strong moral values, share them, and act consistently in accordance with them on a daily basis. As a result, the latter is the true embodiment of integrity.

Three key methods in which followers assess their leader's integrity are laws, codes of conduct, and ethical standards, as well as informal norms and values. Ethical behavior is a process of contemplation and collective activity that concerns an individual's moral behavior based on an established and articulated set of personal ideals. (Bishop, 2013). There has been a lot of research done on the effectiveness of ethical leadership. However, in comparison to the outcomes of ethical leadership, we still don't know enough about the mechanisms that underpin ethical leadership (Zhang, Zhou and Mao, 2018).

"Integrity" is becoming an increasingly prominent notion in government and governance studies, as well as in policymaking at all levels. A variety of basic problems about integrity are

addressed in this contribution to the magazine Public Integrity, whose name reflects the importance of the topic. What is the meaning of the intriguing idea of "integrity?" is the key question.

Everybody desires it, but what exactly is being longed for and talked about? As noted previously, integrity is an essential concept in understanding governance. Not as a replacement for many challenging "ethics theories and approaches" in the field, but as a complement to existing "approaches" and theory development. This assumes the importance of moral values and norms in describing and explaining governance actors' behavior. That should be a challenging topic for future research that presumes an "empirical turn" in research that already focuses on ethics and integrity.

Even though leaders usually bring about change or are successful in their endeavors, the ethical questions lurking in the shadows are those found in the various definitions mentioned earlier. What were the intentions of the leader? What was the leader's strategy for bringing about change? Was the change itself beneficial? A successful leader is both ethical and effective (Ciulla, 1995). Though this may appear to be obvious, the problem would be that we do not always find ethics and effectiveness in the same leader.

In-depth interviews with 121 local political leaders from 65 local authorities in the UK were conducted as part of a qualitative study to determine how ethical leadership practices can restore public trust in political leaders. According to the findings of the study, being a moral person, an ethical political leader sets good examples of behavior, sets the tone at the top, challenges those who do not behave ethically, and encourages, supports, and rewards those who perform and conduct themselves well. As a result, public trust in political leaders is likely to grow gradually. The study also examined ethical leadership practices in the context of a code of conduct, being a moral person, and being a moral leader, taking a three-pillar approach to ethical leadership. Because morality can refer to personal, social, and religious values, a code of conduct or social mores (or norms) from society, or a standard (goodness and rightness) that an individual believes, accepts and applies, the terms ethics and morality are used interchangeably. They employed qualitative analysis in the study to explain how distinct characteristics of ethical leadership (code of conduct, moral person, and moral leader) affect public trust. Without other social processes, ethical codes appear to be insufficient to effect change. The study establishes how the moral person dimension has an influence on the moral leader dimension of ethical leadership (Mozumder, 2021).

Studies on public leadership (e.g., Downe et al., 2013; Mozumder, 2018) have begun to uncover a link between value-based leadership practices and codes of conduct and the impact they have on followers' behaviors and cognitions. The codified framework specifies how a government and its society operate, as well as the behaviors and acts that individuals are required to follow, whereas ethics dictate what individuals should do. Ethical leadership stems from a person's moral sensibility. The study also discovered that ethical leadership is more than just following the regulations (and rules); it also requires a personal moral framework to act as a role model by establishing an example and a tone at the top. The study's findings show how ethical leaders can integrate personal moral frameworks and formal regulatory systems with social learning processes, demonstrating the explanatory potential of moral leadership (Mozumder, 2021).

The study's main results are that ethical leadership is important in politics and that ethical leadership principles like honesty, honoring promises, caring for others, and connecting with the

public can help recover some of the trust that has been lost. Role modeling (setting positive examples) is one way for political leaders to influence the behavior of their colleagues and citizens. This is especially true for individuals who are new to politics. Public perceptions of political leaders' qualities such as honesty, candor, honoring commitments, fairness, and concern for others are likely to have an impact on public trust.

Trust is an important component of political capital (Kjaer, 2013). When our words and actions do not coincide, trust erodes. When politicians promise the public something in order to get elected, and it later becomes clear that they can't or won't do what they promised, it has a significant impact on trust.

Political philosophers and scientists have elaborated their thoughts about the relationship between ethics and politics. Walzer in his article "Political action: The problem of dirty hands" says that, "both dirty hands and moral dilemma challenge the idea that moral values are absolute." "The question is whether we need extremely moralized politics, which tends to utopianism, or extremely politicized morality, which tends to abandon authentic morality entirely. We need to strike a balance by identifying the essential elements of an ethical standard; understanding this could help us reduce tensions between morality and politics" (Walzer, 1973, p 170).

Ethical political leadership in a democracy can be characterized as a sociopolitical process in which leaders are duly elected, led by principles, motivated by public ideals and trust, and acting within the socio-legal framework to influence citizens' lives. Two crucial components of ethical political leadership are public values (or public interests) and trust. Trust is defined as a "psychological state characterized by the intention to accept vulnerability based on positive expectations of another's intentions or behavior." (Rousseau et al., 1998, p. 395). The level of trust citizens have in their elected representatives to act appropriately and honestly in the public interest rather than self-interest is referred to as trust in political leaders (Citrin & Stoker, 2018). For a democratic government to function effectively, citizens must have faith in its leaders (Beerbohm, 2015).

In Elderman Trust Barometer Report in 2022, titled "The Cycle of distrust" it is shown that, there have been a number of high-profile cases of allegedly unethical leadership behavior and procedures recently. The public's trust in political leaders and government has been eroded as a result of these events across the globe. Although faith in government is regarded as essential for the successful functioning of democracy, trust in political leaders and government is at an all-time low. The public's lack of trust in politicians is well documented.

Gardner (1989) in his working paper "The Moral Aspect of Leadership states, and we should all agree that "We should hope that our leaders will keep alive values that are not so easy to embed in laws—our caring for others, about honor and integrity, about tolerance and mutual respect, and about human fulfillment within a framework of values" (Gardner, 1990, p. 77).

In a variety of different ways, a state leader can have a big impact on how their integrity is judged. As a state leader, you can proclaim and practice integrity that will develop enduring trust by knowing your values and what is expected of you, by showing your values, and by leading through your principles.

5.   CONCLUSION

In his book "Nicomachean Ethics" Aristotle in 350 B.C. wrote that "Happiness is the meaning and the purpose of life, the whole aim and end of human existence" or in short "happiness is the end to which we aim in life". Aristotle's Greek word for happiness is *eudaimonea*. It refers to happiness as flourishing rather than pleasure or comfort. A happy life is one in which we flourish as human beings, both materially and personally, as well as morally. The concept of *eudaimonea* provides us with two broad issues that can be utilized to evaluate the overall ethics and efficiency of leadership.

We will have a better understanding of state leadership if we investigate how ethics and morality are closely linked. Ethics as a philosophic subject provides a critical lens through which we can investigate the assumptions that underpin governmental leadership.

When we evaluate all of the definitions and studies undertaken by different researchers on this topic, we conclude that ethical state leadership comprises the ability of leaders to uphold essential moral ideals such as care and respect for others, fairness, and honesty.

John C. Maxwell said that "A leader is one who knows the way, shows the way and goes the way". State Leaders should be driven by the so called moral compass. Cambridge dictionary defines moral compass as "a natural feeling that makes people know what is right and wrong and how they should behave" or as it is defined in dictionary.com "the person's ability to judge what is right and wrong and act accordingly". Another definition that is also relevant to the topic is that moral compass is also "a set of values that guides our decision-making, affects our actions, and defines us as a person" (Ponio, 2021).

In essence, a moral compass is just as its name suggests. All human beings are born with a moral compass. We all have that innate sense of what is right and wrong. It points us in the right direction. Maybe some of us, or some of our state leaders have different definitions of right and wrong, but our moral compass should defiantly provide an objective standard and help them see what is right and wrong.

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Barriers to the Development of Tourism Product Based on Authentic Gastronomy in Rural Areas

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Abstract: *Food tourism in rural areas can be considered a sustainable source of benefits for the local community, but only if it is developed in line with the potentials, interests and capacities of respective host community. Authentic gastronomy of rural areas is considered highly desirable by tourism demand, but there are some barriers to its development that need to be taken into account. This paper is conceptually examining the main challenges of establishing efficient local food networks in rural areas, for the purpose of the development of authentic gastronomy tourism offer. Barriers, identified from the analysis of scientific literature, are elaborated and discussed within the framework of rural areas. Findings, apart from general challenges of tourism development in rural areas, specially emphasise the importance of careful alignment of interests and expectations of all direct and indirect stakeholders in the process of development of authentic gastronomy in rural areas.*

1. INTRODUCTION

Rural food tourism is a potentially sustainable source of local community benefits and a year-round tourism product (Hjalager & Johansen, 2013; Dougherty et. al., 2013). The "total rural tourism experience" is highly sought after by visitors (Kastenholtz et al., 2012) because when tourists sample local gastronomy, they learn about the local culture, and emotional bonds can be formed through these gastronomic experiences (Bjork et al., 2016, Stone, et al., 2017). Nowadays, tourists expect uniqueness in their destinations, and food identity can be used to market and promote a region as a culinary tourism destination by conveying the taste of a place (Bonow and Rytkönen, 2012). In addition to improving the quality of the tourism experience, locally produced and processed food can support the local economy and be an important tool for its diversification (Yi-Chin et al., 2011).

The main topic of this paper is the development of gastronomy tourism in rural areas. As discussed by many scholars and practitioners, traditional and authentic food tourism in rural areas has significant potential to contribute to the regeneration of the respective areas and provide benefits to all stakeholders involved and the local community in general (Rahman et al., 2018; Okumus et al., 2018).

Tourists and visitors value the opportunity to taste authentic local food and experience this part of local culture, history, and daily life (Madaleno et al., 2018). However, providing quality authentic local food in rural areas is not a simple task, but a complex one, especially in terms of organising and establishing efficient and effective collaboration among all relevant stakeholders, e.g., local farmers, restaurateurs, owners/managers of lodging establishments, owners of

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local food/souvenir stores, and local tourism organisations (Dougherty et al., 2013). The large share of national and international dishes, even in regions with significant culinary tradition and availability of local ingredients, is often the result of a non-systemic approach to more successful use of food resources in the active tourism development function (Kalenjuk et al., 2015; Santos et al., 2020).

Therefore, it is important to understand the barriers and obstacles that prevent rural tourism destinations from properly developing their culinary and gastronomic potential. The main purpose of this paper is therefore to identify, conceptualise, and discuss the main challenges in developing an authentic gastronomic tourism offer in rural areas, with a particular focus on issues related to the establishment of efficient local food networks.

2. IDENTIFICATION AND ANALYSIS OF MOST PROMINENT CHALLENGES AND BARRIERS IN DEVELOPING AUTHENTIC GASTRONOMY OFFER IN RURAL AREAS

This paper is conceptual in nature, and the starting point for the analysis to achieve the set objective was the study of available academic literature and case studies dealing with local gastronomy in rural areas. Google scholar was used as the main search engine and numerous papers were found after an initial review. In order to reduce their number and to allow a focus on the chosen topic, several criteria were selected:
- the date of publication (only papers from 2002 to the present were considered),
- the explicit focus on gastronomy (in the title or in the keywords of the paper),
- direct or indirect mention of barriers, challenges, or obstacles to the creation and development of gastronomic offerings.

The rural dimension was important in screening obtained works but was not considered an essential criterion. Likely, some (possibly important) papers were not included due to the large number of papers found and also due to Google scholar limitations. However, this paper is not intended to be a precise bibliographic analysis, but rather a conceptual overview and general classification of barriers and obstacles related to the development of authentic gastronomy in rural areas.
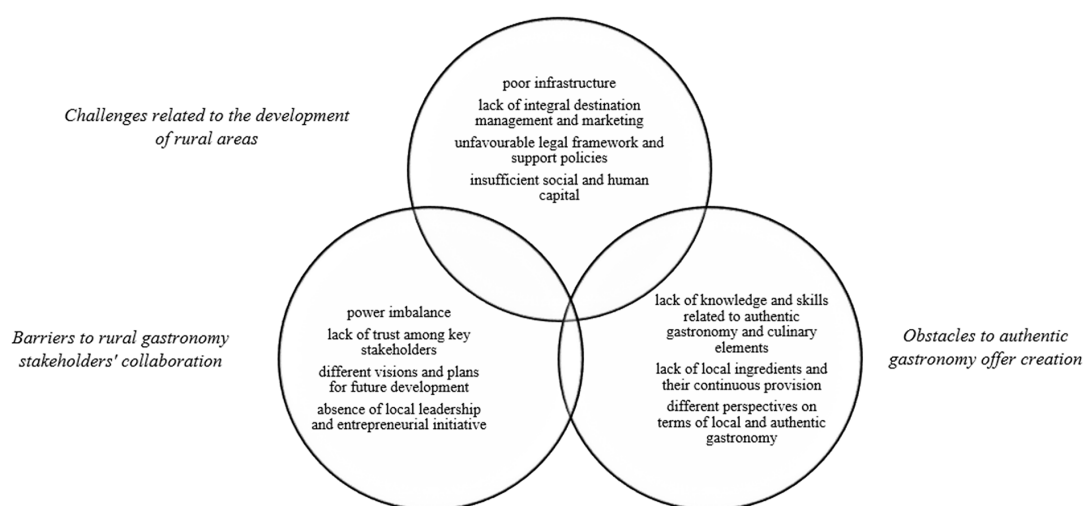
Figure 1. Identified barriers to the development of authentic gastronomy tourism offer in rural areas
Source: Authors' elaboration

After careful analysis of the literature and papers available online, three critical groups of barriers/challenges/obstacles were identified. As can be seen in Figure 1, these groups relate to broader issues that rural areas face in developing tourism, such as lack of quality infrastructure, destination management, and marketing issues (Dougherty et al., 2013)

As pointed out in several papers (Everett & Aitchison, 2008; Kastenholz et al., 2012), many rural areas are not properly recognised and supported by regional and national regulatory frameworks and policies to facilitate development and attract new entrepreneurial initiatives and investments in tourism (including gastronomy tourism).

The second group of obstacles focuses more on the specific characteristics of gastronomy and its authentic and local elements. In these segments, many hospitality and catering establishments that want to offer these types of products struggle with the general lack of sufficient quantities of local ingredients for traditional recipes, their price, and in some cases, lack of skills in preparing authentic gastronomy dishes (Sims, 2010, Jørstad et al., 2020). In addition, supply representatives often disagree on what constitutes local and authentic gastronomy, especially in terms of cultural dimension and geographical proximity (Stalmirska, 2021).

Finally, the third (and perhaps most important) set of obstacles relates to the lack of coordination and cooperation among the various actors involved in local gastronomy. These actors include local farmers, restaurant owners, DMOs, and also civil society organisations that protect and showcase local culture and tradition (Hjalager & Johansen, 2013). Although not explicitly mentioned among the main obstacles, insufficiently developed collaboration among key stakeholders, especially rural entrepreneurs and policy makers, also negatively affects the marketing of specialty foods and rural regions to the postmodern consumer (Sidali et al., 2013).

Alignment of interests among all of the aforementioned groups usually occurs in the organisation and execution of gastronomy events, but aside from that, there is often a lack of ongoing collaboration in providing processes that ensure the success of authentic gastronomy product (Veeck et al, 2006, Bonow and Rytkönen, 2012; Dougherty et al, 2013). When it comes to linking agriculture and tourism providers in rural areas, one of the most important chains is the one between farmers and accommodation providers. It is this supply chain that suffers from various problems leading to economic leakage due to high food imports, and this problem is difficult to solve without external support (e.g., policies to help hotels buy local food) or a strong awareness of the importance of the geographical proximity of food offered to tourists in rural areas as part of their experience (François et al., 2017). Here, we see that building efficient food networks is particularly difficult when actors are more focused on personal economic gain than on supporting the local community and creating long-term benefits and value (Boesen et al., 2017). Finally, an efficient and successful authentic gastronomic tourism product requires local community engagement and active support, either by attending and volunteering at gastronomic events (Kumer et al., 2019) or by promoting positive "word of mouth" about specific high- quality local food providers (Kastenholtz et al., 2012).

3.   FUTURE RESEARCH DIRECTIONS

This work has raised more questions than it has answered, so there are many future lines of research: from conducting primary research in different rural destinations, to comparing gastronomic tourism products, their level of authenticity, and the challenges of implementation and future

development. More qualitative in-depth studies focusing exclusively on the creation of networks and collaboration among different stakeholders in destinations are also necessary. Although questionnaires and interviews are the most common and appropriate method to collect relevant data, it is possible to take a slightly different approach and use secondary data on the number of visitors to gastronomic establishments in rural destinations and their spending on different food products to further objectively assess and analyse the importance of an authentic gastronomic offer.

4. CONCLUSION

The importance of local gastronomy to the development of rural areas is not a new topic, and most scholars and practitioners agree that culinary tourism is an emerging industry in rural areas, providing new jobs and entrepreneurial opportunities.

However, the fact that there are many more potentially great rural gastronomic destinations than examples of good practice suggests that there are very significant challenges and barriers preventing rural destinations from developing an (authentic) gastronomic offering more effectively.

This paper offers some practical insights into this complex issue. Among the identified and presented obstacles, which are divided into three categories, stakeholder collaboration is most emphasised as a critical element for creating sustainable, attractive and well-presented authentic gastronomy products in rural areas. More attention should be paid to efficient and effective collaboration among all relevant local stakeholders in providing unique and high-quality local food experiences in academic research as well as in the creation of practical support measures at the local and regional levels.

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Concept and Measurement of Memorable Tourism Experience

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Abstract: *In the last twenty years scholars and practitioners have shown interest in exploring the concept of tourist experience from different perspectives. However, therefore less attention has been paid to the research on the tourist experience with special emphasis on the concept of memorable experience (MTE). Starting from the above, the purpose of this paper is to present a detailed and systematic quantitative research review aimed at identifying new trends in MTE research and reducing the existing gaps in the experience economy literature. For the purposes of this research, 47 studies on MTE published between 2010 and 2021 were analyzed according to the year of publication, geographic coverage, publication source and forms of tourism. The results of this study suggest that the largest number of studies of MTE were conducted in 2019 (21.28%) in Asia (56.81%) and published in the journal Anatolia (10.64%). Further analysis revealed that the largest number of research were carried out in the context of destination and gastronomic tourism. Therefore, only for these two forms of tourism, the causal relationship of different variables was analyzed, thus gaining an insight into their measurement instruments. In measuring the destination memorable tourism experience the MTE model is the most common one, while in measuring gastronomic tourism the most frequently applied dimensions are novelty, food quality, service environment and atmosphere. From a management perspective, the findings of this study offer practical implications for measuring MTE, especially in the context of destination and gastronomic tourism. Based on the analyzed data, tourism providers can get an insight into the tested and valid instrumentation that can allow them to determine strengths and weaknesses in the existing elements of their offer always focusing on the possibilities for long-term improvement of the whole service.*

1. INTRODUCTION

It is extremely difficult to define the tourism industry as it does not represent one product but, in relation to other sectors, it covers a number of different activities and stakeholders, such as accommodation, transportation, attractions, tourist companies and alike. Most scientific experts define tourism as the phenomenon arising from temporary visits (or stays away from home) outside the normal place of residence for any reason other than furthering an occupation remunerated from within the place visited (Burkart & Medlik, 1981). The importance of tourism globally is evident by the fact that the direct contribution of travel and tourism to GDP in 2020 amounted to approximately 4.7 trillion US dollars (Tourism Worldwide, 2021). Therefore, one can say that tourism is a complex phenomenon and a driver of the world economy (Laškarin et al., 2022). In order to generate more revenue within this industry, providers of its products and services seek to determine the wishes and needs of tourists. What was observed at the beginning of the 21st century is that society as a whole is no longer satisfied with the classic offer of products and services, but tends to create memorable experiences (Marković et al., 2021).

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Experience is a subjective, intangible, continuous and highly personal phenomenon (O'dell, 2007) that exists only in the mind of the individual, engaged on an emotional, physical, intellectual or even spiritual level (Pine & Gilmore, 1998). In the context of tourism, it consists of people, services and places (Westwood, 2006). It represents a past travel-related event that was important enough to store it in the memory of tourists in the long term (Larsen, 2007). It can be said that it is characterized by a combination of novelty that includes the individual search for identity and self-realization (Selstad, 2007), that is, the search for happiness and well-being (Sharpley & Stone, 2012). According to Chan & Baum (2007), the quality of the tourist experience is characterized as an effective response of tourists to the desired social-psychological benefit.

How the tourist experience is remembered after traveling, with the passage of time, creates the greatest discrepancy between the tourist experience and the memorable tourism experience (Zhong et al., 2017). The process of deciding to resume a trip has a greater impact on the memorable experience in relation to the general tourist experience (Zhang et al, 2018). Therefore, memory is placed an indispensable role because it allows the individual to relive the event that happened (Neumann, 1992). Pleasant memories of such an experience significantly affect tourists thus creating a positive mood and a sense of happiness that often plays a significant role in tourists' life (Hull, 1990). Each individual eliminates unwanted content in his consciousness through the filtering process and thus retains only favored memories (Oh et al., 2007). This is important because these memories become stimulators and main predictors of the return of tourists to the tourist destination (Wirtz et al., 2003).

In its measurement, the most commonly used instrument in research studies is the MTE model. According to the MTE model, the dimensions of MTE are (Kim et al., 2012): (1) hedonism, (2) inclusion, (3) knowledge, (4) local culture, (5) meaningfulness, (6) novelty and (7) refreshment. Hedonism is represented by pleasant feelings that excite tourists, such as fun, enthusiasm and enjoyment (Zhang et al., 2018), while inclusion implies the possibility of tourists to actively participate and enjoy tourist activities (Kim & Ritchie, 2014). Active participation will allow tourists to learn more about the host local culture (Zhang et al., 2018) and to broaden their knowledge and skills. In such a way, whilst doing something significant, tourists will experience the essence of something meaningful and worth of their time and effort where they are able to learn something new about themselves (Rašan, 2021). Such insights and novelties in the form of new knowledge create a feeling of refreshment in their lives.

Based on the above it is possible to see the importance of creating a high-quality experience for tourists that will be stored in their memory in the long run. Therefore, the main purpose of this research is to systematically identify and evaluate studies dealing with MTE. The specific objectives of this study are to analyze MTE research studies according to (1) year of publication, (2) source of publication, (3) geographic area of the sample where research was conducted and (4) the forms of tourism where the MTE concept is emphasized. Starting from the set objectives, the basic research question is formulated: "In which selective form of tourism the memorable tourism experience is most strongly expressed?". The conducted research and answers to the research questions will give tourist products and service providers insight into the tested and valid previous instrumentation used to measure MTE. In the future, the most important factors used in previous measurements can serve tourism service providers to measure MTE according to the tourism forms. In such a way they can obtain reliable indicators that can help them determine strengths and weaknesses in the existing elements of the current offer and facilitate the improvement of the product and services they deliver. This review article is structured in a way that the introduction is followed by methodology, results, conclusion and list of references.

2. METHODOLOGY

In the analysis, mapping and synthetization of the relevant scientific literature on MTE a mixed approach was used. More precisely, a systematic quantitative literature review was divided into 5 stages (Khoo-Lattimore et al., 2019):

(1) establishing the review aims;
(2) identifying search keywords, databases and literature selection criteria;
(3) searching databases, screening search outcomes against the criteria identified prior and fine-tuning of the inclusion criteria;
(4) presentation of research results in graphical and tabular form;
(5) synthesis of the most important factors in measuring memorable tourism experiences according to the most represented forms of tourism.

The intention of this research was to obtain comprehensive and representative picture of the researched topic in order to determine the most important factors in measuring memorable tourism experience applied in various forms of tourism. For the purposes of this research, relevant scientific literature was researched. The scientific papers were collected on world databases: Google Scholar, Emerald insight and ScienceDirect. The following keywords were searched: 'memorable tourism experience' and 'measuring memorable tourism experience'. Mendeley reference management software was used to store and organize the relevant papers. After searching the literature, the following inclusion criteria were applied in the selection of papers for the sample:

- papers should be written in English;
- papers should be published from 2010 to 2021 and
- papers should deal with the memorable tourism experience.

In accordance with the above criteria, the sample included 47 papers. These were subsequently analyzed according to the year, source of publication, geographical area of the sample and the forms of tourism. Descriptive statistical analysis was used to process the data, and the obtained results were presented in graphic or tabular form. In addition to quantitative analysis, a qualitative content analysis of factors used in measuring the memorable tourism destination and the gastronomic experience was carried out.

3. RESULTS

This chapter presents the literature review results of the memorable tourism experience. Descriptive statistical methods were used in the analysis of selected papers according to predetermined parameters such as frequency analysis by year of publication, paper analysis by the source of publication, paper analyses by geographical area of the sample where the research has been conducted, and paper analysis according to the forms of tourism. The initial analysis focused on determining the number of articles on MTE published on an annual basis (Figure 1).

Publications on the MTE concept started at the beginning of the 21st century, but expansive growth has been noted since 2010. Therefore, this review covers studies over a period from 2010 to 2021. From the graph, it is possible to see that the number of publications in the observed period is continuously rising up until 2019. The largest number of papers was published in 2019 - 10 or 21.28%. After 2019 a decline in the number of papers is noted (14,89% in 2020 and 8,51% in 2021). The reason behind such a poor number of papers published on the research topic might be COVID-19 and travel suspension. For this reason, academic experts were hampered and, in some way, prevented from conducting research on tourists immediately after the tourist experience was achieved.
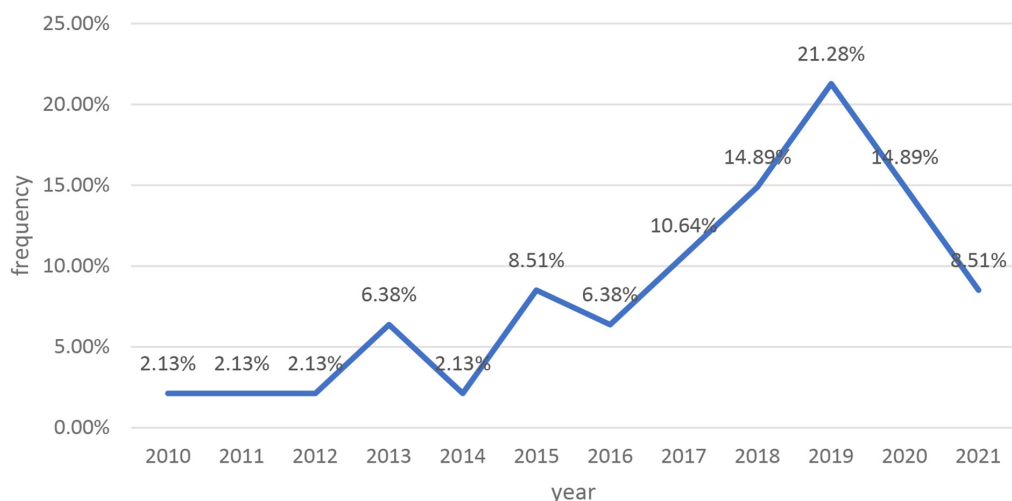
Figure 1. Article analysis by year

Source: Authors' research

In addition to the previously performed analysis, an analysis of the geographical location of the sample of the conducted research was carried out.
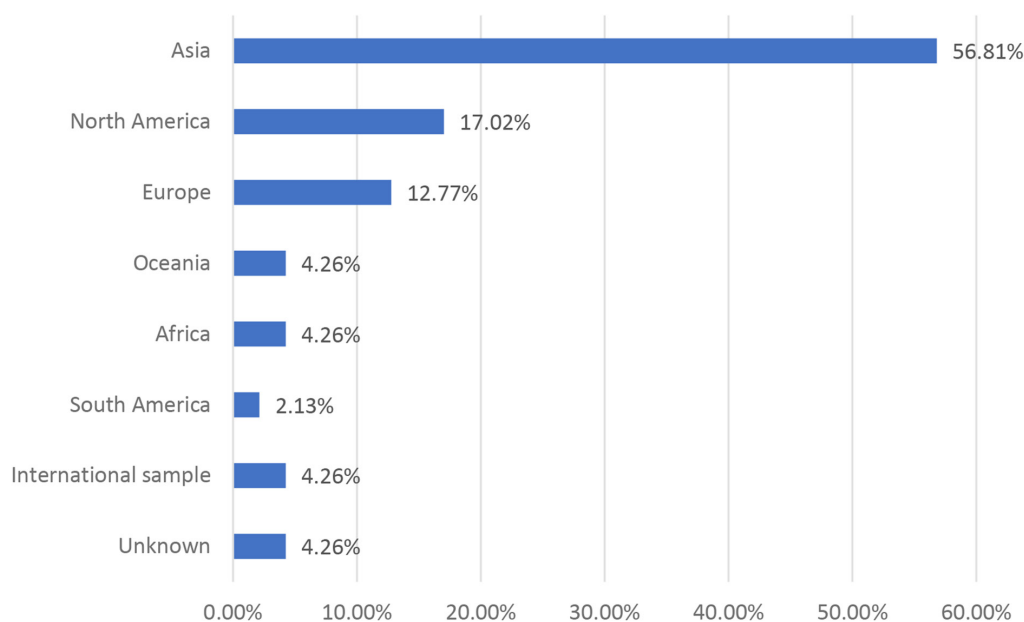
Figure 2. Article analysis by geographical location of the sample

Source: Authors' research

According to the analyzed data, it was found that the largest number of research, namely 56.81% was conducted in Asia - countries such as Taiwan (19.15%), India (10.81%), China (8.11%), Indonesia (8.11%), Malaysia (4.26%), Iran (4.26%) and Vietnam (2.13%). Asia is followed by North America with 17.02% of papers published and Europe with 12.77% of papers published. The lowest number of research was conducted on the sample of travelers in Africa (4.26%), Oceania (4.26%) and South America (2.13%). Two studies had an international sample (4.26%), and only in 4.26% of the research the sample coverage was not specified.

The analysis by the source of publication of the journal where the relevant paper was published is presented in the table that follows.

Table 1. Articles analysis by sources of publication

Source Title	Authors and year	*f*	%
Journal title			
ANATOLIA	Kim (2013); Sthapit (2017); Saayman & Van Der Merwe (2015a); Zare (2019); Dias & Dias (2019)	5	10,64%
Journal of Travel Research	Kim et al. (2014); Kim (2018); Kim et al. (2012); Stone et al. (2018)	4	8,51%
Journal of Hospitality Marketing and Management	Tsaur et al., 2020; Horng and Hsu (2021), Sipe & Testa (2017)	3	6,38%
Current Issues in Tourism	Gohary et al. (2020); Hung et al. (2016)	2	4,26%
Tourism Analysis	Kim et al. (2010); Zhong et al. (2018)	2	4,26%
Sustainability	Chen et al. (2020); Santos et al. (2020)	2	4,26%
Tourism and Hospitality Research	Quadri-Felitti & Fiore (2013); Bruwer & Rueger-Muck (2019)	2	4,26%
Annals of Tourism Research	Lee, 2015; Ritchie &Tung (2011)	2	4,26%
Others	Chandralal et al. (2013); Chen et al. (2021); Coelho et al. (2018); Coudounaris et al. (2017); Dagustani et al. (2017); Ernawadi et al. (2020); Mahdzar et al. (2015); Sthapit et al. (2019); Vada et al. (2019); Yu et al. (2019); Zhang et al. (2018); Tiwari et al. (2021); Saayman & Van Der Merwe (2015b); Park et al. (2021); Kala (2020); Cao et al. (2019); Wei et al. (2019); Castellani et al. (2020); Dagustini et al. (2018); Chen & Rahman (2018); Sharma & Nayak (2019); Bec et al. (2019)	22	46,81%
Conference Proceedings			
Tourism & Hospitality Industry 2018	Horvat et al (2018)	1	2,13%
Innovation and Best Practices in Hospitality and Tourism Research 2016	Mahzdar (2016)	1	2,13%
Book chapter			
The handbook of managing and marketing tourism experiences	Smith et al (2016)	1	2,13%
IN TOTAL	-	47	100%

Source: Authors' research

Almost all publications were published in journals on tourism and hospitality (Table 1), except for the Saayman & Van Der Merwe (2015b) study which was published in the *African Journal for Physical Health Education, Recreation and Dance.* There is only one study out of the total number of studies that was published in the book, as a special book chapter (Smith et al., 2016) that makes 2.13%. Two research studies were presented at the conference (Horvat et al., 2018; Mahzdar, 2016) that makes 4.26% while the remaining papers were published in scientific journals (93.48%). Therefore, 44 studies were published in 30 different scientific journals. The largest number of articles were published in *ANATOLIA* (10.64%), followed by *the Journal of Travel Research* (8.51%) and *the Journal of Hospitality Marketing and Management* (6.38%). Based on the data presented above, in each of the following journals 4,26% of the papers were published - *Sustainability, Tourism and Hospitality Research, Annals of Tourism Research, Current Issues in Tourism, and Tourism Analysis*. Only 2.13% of the studies on the memorable tourism experience were published in the remaining journals.

Lastly, the authors dug deeper into the frequency of the MTE research topic. The results of the research have shown that, predominantly, eight forms of tourism were determined: destination, gastronomic, wine, eco, cultural, health, creative and sports tourism. According to the above, it

is evident that the most prominent form of tourism is the destination (44.68%) and gastronomic tourism (23.40%). Consequently, the models used in measuring the MTE in publications related to these two forms of tourism will be described below in more detail.

Table 2. Article analysis by the form of tourism where the MTE concept has been applied

Type of tourism	Authors and year	f	%
Destination tourism	Kim et al. (2010); Ritchie & Tung (2011); Kim, Ritchie & McCormick (2012); Chandralal & Valenzuela (2013); Kim (2013); Kim & Ritchie (2014); Mahdzar et al. (2015); Dagustani et al. (2017); Zhong et al. (2017); Coudounaris & Sthapit (2017); Coelho & Gosling (2018); Kim (2018); Zhang et al. (2018); Horvat et al. (2018); Vada et al. (2019); Wei et al. (2019); Yu et al. (2019); Chen et al. (2020); Castellani (2020); Ernawadi & Putra (2020); Tiwari et al. (2021)	21	44,68%
Gastronomy tourism	Chen et al. (2021); Lee (2015); Sthapit et al. (2019); Sthapit (2017); Tsaur & Lo (2020); Park et al. (2021); Stone et al. (2018); Kala (2020); Horng & Hsu (2021); Cao et al. (2019); Sipe & Testa (2017)	11	23,40%
Wine tourism	Saayman & Van Der Merwe (2015a); Saayman & Van Der Merwe (2015b); Quadri-Felitti & Fiore (2013); Bruwer & Rueger-Muck (2019); Santos et al. (2020)	5	10,64%
Eco tourism	Dagustani et al. (2018); Gohary et al. (2020); Mahdzdar (2016)	3	6,38%
Cultural tourism	Chen & Rahman (2018); Zare (2019)	2	4,26%
Health tourism	Dias & Dias (2019); Smith et al. (2016)	2	4,26%
Creative tourism	Hung et al. (2016)	1	2,13%
Sport tourism	Sharma & Nayak (2019)	1	2,13%
Heritage tourism	Bec et al (2019)	1	2,13%
IN TOTAL	-	**47**	**100%**

Source: Authors' research

3.1. Destination Tourism

In most studies on the topic of destination tourism, a modified MTE model was used as a measuring instrument. Kim et al. (2010) used 8 dimensions in measuring MTE: hedonism, novelty, local culture, refreshment, meaning, inclusion, knowledge and future intentions. On the other hand, most authors used MTE seven-dimensional scale (38.10%) meaning that all previously mentioned dimensions were included with the exception of future behavioral intentions (Kim et al., 2012; Kim et al., 2013; Degustani et al., 2017; Zhong et al., 2017; Coudounaris & Sthapit, 2017; Zhang et al., 2018; Chang et al., 2019; Tiwari et. al., 2021). In 52.24% of the studies, the main focus was on testing the MTE factors' effects on tourist behavior intentions (Sthapit, 2013; Kim & Ritchie, 2014; Mahdzar et al., 2015; Degustani et al., 2017; Coudounaris & Sthapit, 2017; Kim, 2018; Zhong et al., 2017; Zhang et al., 2018; Chen et al, 2020; Ernawadi & Putra, 2020, Tiwari et al, 2021). Also, in 9.52% of memorable tourism experience study's authors explored the statistically significant MTE dimensions impact on tourist satisfaction (Zhong et al., 2017; Kim, 2018). Mahdzar et al. (2015), in addition to MTE dimensions and behavioral intentions, added another attribute - destination construct. They concluded that destination attributes that affected pleasant moments could serve as a catalyst for creating MTE and visitors' behavioral intentions. Chen et al. (2020) and Coudounaris & Sthapit (2017) added the importance of emotions as another factor in measuring MTE. In relation to other studies, Ritchie & Tung (2011) applied a qualitative approach, conducting research with an in-depth interview and based theory methods. In doing so, they identified four dimensions of MTE: influence, expectations, consequentiality and recollection. Chandralal and Valenzuela (2013) also conducted an in-depth interview but with one difference. They analyzed the data obtained by

the inductive method, determining the cognitive and affective domain of MTE. The only study of MTE from the perspective of a tourist service provider was Castellani et al. (2020). The mentioned author added another dimension to the MTE model - the surprise. In conclusion, it can be said that hedonism, novelty, local culture, refreshment, meaning, inclusion and knowledge were the most applied dimensions of the MTE model. A seven-dimensional MTE model is a valid instrument for measuring the MTE in the context of destination tourism. It has also been proven, on the basis of previous research, that MTE is a great predictor of satisfaction and tourists' behavioral intentions.

3.2. Gastronomic Tourism

Gastronomic tourism was identified as the second most common form of tourism for which the MTE was measured (23.40%). This statement is not surprising given the importance of gastronomy in generating economic benefits for tourist destinations. This is further proved by the estimated tourists' consumption of food and beverage - 25% of total expenditures (Wilkinson, 2016). For the mentioned reason, there is a need to create a memorable gastronomic experience for tourists. In his study of the exploration of the gastronomic experiences that tourists remembered in the long term, Lee (2015) used a modified MTE model of five dimensions: hedonism, local culture, meaning, knowledge and refreshment. The authors also wanted to establish the relationship between motivation, nostalgia and MTE in restaurants. Finally, the research proved that nostalgia has an indirect effect on personal feelings about MTE. In fine dining restaurants, the measurement of a memorable dining experience was analyzed by Tsaur & Lo (2020) applying four factors: excellent staff behavior, excellent and delicious food, high perceived value and pleasant atmosphere. Their research results have proved that guests prefer traditional cuisine because of the feeling that the *chef* has done his best for creating the atmosphere in the restaurant. According to an in-depth interview with tourists, Sthapit (2017) developed a model for measuring a memorable gastronomic experience that includes the following dimensions: local specialties and attributes of food (taste), authenticity, novelty, togetherness and social interaction, hospitality, service environment and gastronomic souvenirs. Also, the aforementioned author, Sthapit in collaboration with his associates (2019) revised his model by creating dimensions of novelty, co-creation experience, service environment, overload of choices, memorable gastronomic experience, experience enhancement and hedonistic well-being. The research has proven that the memorable gastronomic experience was mostly influenced by the following factors: co-creation of the tourist experience, the service environment and the intensification of memories. If one compares the last two models with the original MTE model, the novelty dimension is the only matching dimension. Referring to all of the publications analyzed, the only exception is the Chen et al. (2021) study. These authors used the original MTE model in measuring the MTE from the gastronomy point of view. Given this knowledge, it can be concluded that the original MTE model is not the most accepted one in the studies performed, particularly, for the conclusion is valid for gastronomic tourism. However, its modified versions are used in measurements and serve as a good basis for creating new scales and models.

4. CONCLUSION

These days, most probably also due to the strong impacts of the COVID-19 pandemic, various tourism stakeholders are fighting fiercely for survival in the market. It is possible to achieve a competitive advantage whilst ensuring MTE. Therefore, the importance of this article review arises in the form of determination of the most important tourism forms of special interest where it is possible to realize an experience that tourists will remember in the long run. The research results have shown that the largest number of research on this topic was carried out in the

context of destination and gastronomic tourism. Having this in mind, the research was carried out on the causal relationship between different variables with respect to the identified forms of tourism which gave an insight into their measurement instrumentation. In destination tourism, the MTE model is most used in measuring a memorable experience whilst in the case of gastronomic tourism various scales have been applied to focus on the dimensions of novelty, food quality, service quality, and atmosphere. Also, based on the review of the selected 47 scientific articles, this study has identified and reduced the gaps in the literature at the same time presenting new directions for future research.

From a management point of view, the contribution of this research is extremely important for suppliers of tourism products and services. In accordance with the analyzed data, they could obtain information on tested and valid tools that could be used in the future to measure the memorable tourism experience with regard to the form of tourism they are engaged in. With this approach, major tourism stakeholders could obtain relevant results for determining strengths and weaknesses in the existing elements of their offer whilst focusing on their long-term improvement.

Despite the fact that this review provided insight into the current state of MTE, it also has certain limitations. An example of this is the fact that in this literature review, only articles published in English in the period from 2010 to 2021 were considered. For this reason, future research should cover a wider time frame and also include articles in languages other than English in the sample. Likewise, the proposal for future research is: (1) to include a larger sample in the review due to the representativeness of the results; (2) to include other relevant scientific databases whilst searching relevant research papers; (3) to apply cluster analysis by keywords and (4) in addition to the field of destination and gastronomic tourism, future research should focus more on measuring the memorable tourist experience of eco, sports, wine, health and heritage tourism.

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Memorable Sensory Experience in Restaurant: A State-Of-The-Art Review

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Abstract: *The restaurant industry is no longer expected to provide only high food and service quality but to stimulate the senses that will contribute to creating a memorable experience for restaurant guests. Thus, sensory senses play an increasingly important role for restaurateurs, especially in the context of nurturing long-term relationships with guests. Therefore, the main purpose of this research is to identify and evaluate studies that dealt with a memorable sensory experience of restaurant guests. The findings of this study indicate that the largest number of studies was published in 2019 (24%) in Asia (36%). Furthermore, scientific experts included all five sensory components in only 32% of the studies examining guests about their memorable restaurant experiences. The contribution of this research is reflected in determining the presence of sensory perception in the literature related to gastronomy. The results of this research enable the awareness of restaurateurs and scientific experts about the importance of examining the sensory perception of restaurant guests.*

1. INTRODUCTION

Every restaurant strives to create a memorable guest experience in order to build a long-term relationship. In doing so, the restaurant must take into consideration that the experience for each guest is individual, more precisely it differs from person to person. In other words, it exists in the mind of the individual, engaged on an emotional, physical, intellectual, or even spiritual level (Pine & Gilmore, 1998). So, a memorable experience represents an event of sufficient importance to be stored in the long-term memory (Larsen, 2007) of the restaurant guest. Memory is an indispensable role because it allows an individual to relive an event that happened in the past (Neumann, 1992).

Often reliving a positive event in the mind, is a predictor of the guest's return to the restaurant (Servidio & Ruffolo, 2016). Such a restaurant experience can be characterized as episodes, a chunk of time that one went through with sights and sounds, feelings and thoughts, motives and actions closely knitted together, stored in memory, labeled, relieved, and communicated to others (Hassenzahl et al., 2013). It is no longer enough to provide high food and service quality, it is necessary to stimulate the strengthening of the guest's senses in experiencing restaurant products, services and the physical environment. Thus, it is essential to use sensory aspects to develop the concept to enhance the overall restaurant experience (Schifferstein, 2006). Sensory perception is perceived as the way one notices things with the senses of smell, hearing, sight, sound, and touch, or how one thinks about something and his/her idea of what it is like (Qiong, 2017). Thus, sensory perception encompasses all five human senses - vision, smell, taste, touch, and sound (Hultén, 2015). In the restaurant industry, sensory stimulation is most often achieved through ambient smell and taste.

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The main purpose of this research is to use a systematic quantitative approach to analyze in detail the studies that deal with the memorable sensory experience of guests who visited the restaurant. The specific objectives of the research are to analyze selected studies according to (1) year of publication, (2) geographical area and (3) components of memorable sensory experience in the restaurant. Starting from the set goal, the following research question was formulated: "What are the most common components of memorable sensory experience in the restaurant?". Through the conducted research, scientific experts will gain insight into the representation of sensory components in previous research. This review article is structured in such a way that the introduction is followed by the methodology, results, conclusion and references.

2. THEORETICAL FRAMEWORK

The smell is one of the strongest human senses, which influences his/her emotions, motivation and memories with extreme intensity (Herz, 2011). Different olfactory signs or signals can evoke memories that are usually even more intense than those elicited by auditory, tactile, visual, or verbal signs (Morrin, 2011). Over the years, ambient fragrances have been increasingly used in restaurants (Lukander, 2021). The reason for this is that smell help to improve the atmosphere in space by having an indirect impact on guest behavior (Kotler, 1973). Specifically, the use of ambient scents (smell) can affect the positive mood of the guest which can ultimately increase the revenue of the facility (Morrin, 2011).

The taste of food is realized through taste buds that are found all over the tongue and in the back of the mouth (Lukander, 2021). People recognize only six primary flavors, and these are sweet, sour, salty, bitter, umami (Schiffman, 2000) and fatty (Keast & Costanzo, 2015). It is the expectations about food quality that affect our perception of taste (Krishna, 2013), and it is up to the restaurant facility to exceed the expectations of its guests. Given the cultural differences, there are really different combinations of dishes that mix flavors sweet and salty, salty and bitter, etc. So, the possibilities are endless and only imagination is the limit when coming up with new, innovative ideas to stimulate the senses through food (Lukander, 2021). Therefore, it is extremely important how to recognize and use taste in creating a memorable restaurant experience for restaurant guests.

The sense of sight has a great effect on the guest's perception of various restaurant components, such as the physical environment of the interior and exterior (Carins et al., 2020; Horng & Hsu, 2020, 2021; Wardono et al., 2012; Marković et al, 2021a), the food aesthetic (Marković et al, 2021a, 2021b; Oh & Kim, 2020; Ouyang et al., 2018; Tsaur et al., 2020) and aesthetic labor (Marković et al, 2021a, 2021b; Hanks & Line, 2018; Horng et al., 2013; Horng & Hsu, 2020, 2021). In the literature, most research is devoted to the visual aspect of the restaurant experience (Hussein, 2018; Liu & Tse, 2018; Richardson et al., 2019). It is therefore not surprising that sensory marketing is most focused on the sense of sight (Lukander, 2021). Visual media, such as social media, influence the recognizable and memorable sensory signature of a hospitality company (Krishna, 2013). The visual aspect is especially noticeable through the guest's perception of the use of colors in the restaurant, whether it is the physical environment (Horng & Hsu, 2021) or the appearance of food and beverage (Paakki et al., 2019).

Music is one aspect of a restaurant's sensory experience and as such can be the slower or faster tempo and quieter or louder. Slow-tempo music is associated by the customer, in this case, the guest, with a more relaxed atmosphere, quiet space and soothing effect (Meyers-Levy et al., 2011). Although there are no differences in the level of customer satisfaction in stores with regard to the volume of music,

it was found that customers spend less time in stores where the music was louder compared to places where the music was quieter (Fulker, 2019). In addition to the impact of music volume on guest consumption (Piqueras-Fiszman & Spence, 2014), it also has an impact on their overall experience. Of course, music has a significant impact on the time spent in a restaurant. Proof of this lies in the fact that regardless of the tempo of the music, the guests ate the same amount of food, but consumed larger amounts of beverages (Milliman, 1986). In other words, revenue from beverages increased by 41% in the case of playing faster-paced music in a restaurant (Milliman, 1986).

Although in the literature on restaurants, touch is the least researched topic, as sensory stimulation is equally important for guests. Touch is called the proximal sense, which can be used to detect objects, shapes and sizes (Peck, 2011). Thus, touch is a close sense in which contact is required to perceive an object (Klatzky, 2011). Aristotle believed that touch transmits all the senses of perception, making it the strongest sense (Siegel, 1975). With the help of touch, the consumer obtains information and makes the final decision with the important goal of purchase (Lukander, 2021). According to the above, for a person, the hands are the first contact with different surfaces on the basis of which he creates the first impression of the product (Lukander, 2021). Therefore, in some cases, providers of hospitality products and services concentrate on encouraging the touch of guests by using different materials and surfaces in the restaurant environment.

3. METHODOLOGY

In this study, secondary data were taken, and in their analysis, mapping and synthesis, a systematic quantitative literature review was used (Khoo-Lattimore et al., 2019), which consists of the following stages:
- establishing the review objectives;
- identifying search keywords, databases and literature selection criteria;
- searching databases, screening search outcomes against the criteria identified prior and fine-tuning the exclusion and inclusion criteria;
- presentation of graphical and tabular research results;
- analyzing summary tables.

The intention of this research was to get comprehensive picture of the components of sensory perception of restaurant guests, in order to determine their representation in research on a memorable restaurant experience based on the collected and analyzed data. In the global Google Scholar database, the relevant scientific literature was searched by the keywords "memorable sensory experience in restaurant", "memorable restaurant experience", "memorable dining experience" and "memorable gastronomic experience". After the papers dealing with this topic were found in the mentioned databases, they were stored in the Mendeley reference management software (available for free at: https://mendeley.en.softonic.com/). Given that there were a large number of papers, 46 to be precise, the following elimination criteria were selected in the selection of papers to be included in the final sample: (a) the papers must be written in English; (b) papers must be published from 2017; (c) the papers must deal with the topic of the memorable sensory experience of restaurant guests as a main concept or as part of the examining instrument of research on memorable restaurant experience. According to the above criteria, 25 studies were finally selected in the sample and analyzed according to the year of publication, geographical coverage and research components. Descriptive statistics were used in data processing for the first two analyzes, and the obtained results were presented by graphical method. In addition to the previous quantitative part, content analysis was applied for the qualitative part of the research (Table 1).

4.   RESEARCH RESULTS

In this chapter, the results of a literature review of a memorable sensory experience of restaurant guests are presented. The reviewed and selected papers are analyzed according to predetermined parameters, namely: (1) year of publication, (2) geographical coverage and (3) review of models used in examining the memorable sensory experience of restaurant guests.
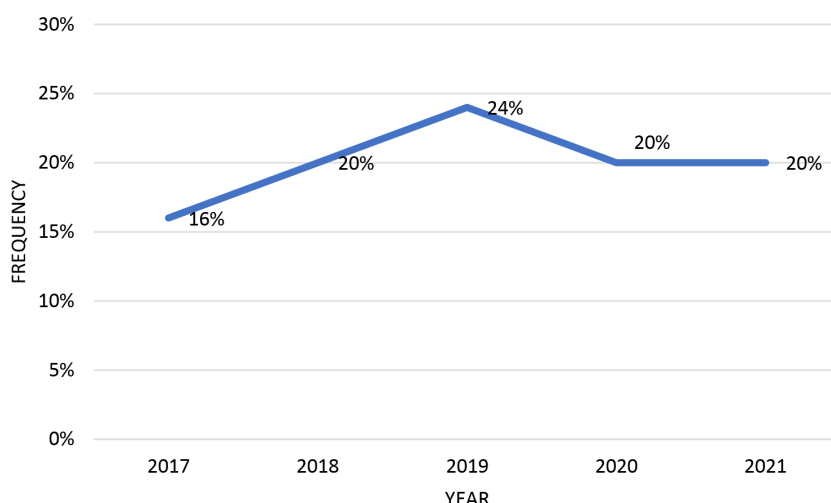
Figure 1. Articles analysis by year (2017 – 2021)
Source: authors' research

The frequency analysis was aimed at determining the number of articles on a memorable sensory experience in a restaurant, considering the year in which the articles were published. The analysis includes articles for the period from 2017 to 2021, more precisely the last five years. As shown in the graphic, the largest number of papers was published in 2019 (24%), while in the next two years, there was a decline in the number of papers. Due to the appearance of the COVID-19 pandemic, restaurant facilities were closed, which also affected the reduction in the number of papers on the researched topic.

The following is a geographical analysis of papers on a memorable sensory experience in a restaurant.
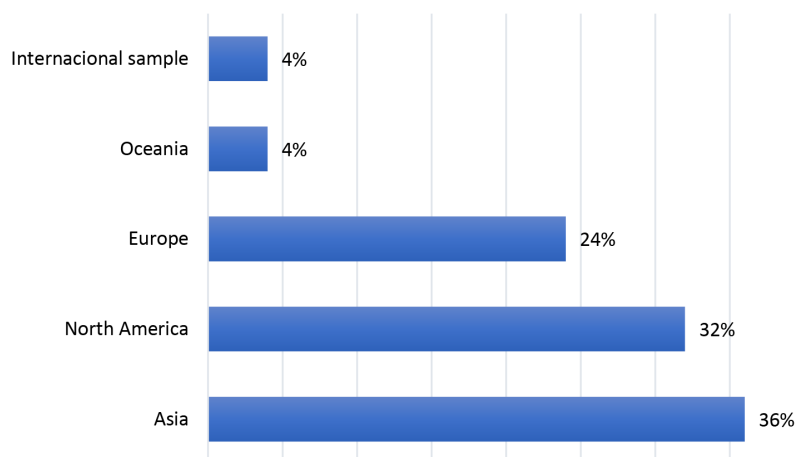
Figure 2. Geographical articles analysis
Source: authors' research

Table 1. Content analysis of previous memorable sensory experience in restaurant research

Author and year	Constructs and/ or dimensions
Ouyang et al. (2017)	Constructs: food aromas, emotion, impression of food and restaurant
Sthapit (2017)	Dimensions: local specialties and food attributes (taste), authenticity, novelty, togetherness and social interaction, hospitality, servicescape, food, souvenirs
Bekar (2017)	Constructs: aesthetic value components, customer aesthetic experiences, behavioral intentions Dimensions of construct aesthetic value components: interior visual appeal, exterior visual appeal, sensory appeal
Ding & Lee (2017)	Dimensions: entertainment, food culture, nostalgia, stress relief, healthy diet education.
Yoon & Chung (2018)	Dimensions: perceived risks, perceived benefits, attitudes, purchasing intention
Liu & Tse (2018)	Constructs: restaurant attributes, satisfaction, behavioral intentions Dimensions of restaurant attributes construct: food, service, price and value, convenience, atmosphere
Hussein (2018)	Dimensions: food aspects, interaction quality, physical environment and service outcome.
Stone et al (2018)	Dimensions: food / drink, location / setting, companions, occasion, touristic elements
Hanks & Line (2018)	Constructs: social servicescape, attitude to restaurant, experience satisfaction, cognitive loyalty Dimensions of social Servicescape construct: employee Servicescape (Perceived Similarity, Physical Appearance, Suitable Behavior) and customer Servicescape (Perceived Similarity, Physical Appearance, Suitable Behavior) Dimensions of cognitive loyalty construct: return intention, WOM intention, EWOM
Richardson et al (2019)	Constructs: dining experience attributes, satisfaction, behavioral intentions Dimensions of dining experience construct: food quality, service quality, ambience, convenience
Sthapit et al (2019)	Constructs: Novelty seeking, Experience co-creation, Servicescape, Choice overload, Experience intensification Memorable local food experience, Hedonic well-being
Cao et al (2019)	Constructs: sensory, behavioral, affect, social, overall experience
Liao & Fang (2019)	Constructs: attitude, subjective norm, perceived behavioral, landscape perception and preference, behavioral intention
Paakki et al (2019)	Dimensions: aesthetics in food, colors in food, green color in the eating surroundings
Zhang et al (2019)	Constructs: cafe experience, value for money, consumer satisfaction, loyalty intentions Dimensions of cafe experience: food quality, coffee quality, beverage quality, service quality, ambience
Horng & Hsu (2020)	Constructs: physical environment, product and service, employee's aesthetic traits, other customer's aesthetic traits
Wen et al (2020)	Constructs: Music Enjoyment, Music Congruency, Perceived Authenticity. Satisfaction, Behavioral Intention
Kala (2020)	Variables: Restaurant Location, Hygiene & Cleanliness, Decoration, Restaurant Atmosphere, Physical Environment Experience, Traditional Food Preparation, Authentic Local Food, Attractive Food Presentation, Healthy Food & Ingredients, Food Quality, Service Quality, Service Employee Attributes, Human Interaction Experience
Moon et al (2020)	Constructs: Inter-table distance, Exclusive use, Place dependence, Place identity, Uncomfortable gazes from others, Perceived territoriality, Solo dining satisfaction, Revisit intention to dine alone, Desire for gastronomy, Desire for convenience
Tsaur & Lo (2020)	Dimensions: excellent service behavior, exquisite and delicious cuisine, amazing physical environment and unique atmosphere, high perceived value
Horng et al (2021)	Constructs: aesthetic guest experience (dining environment), pleasantness, memorable experience, behavioral intentions Dimensions of aesthetic guest experience construct: physical environment, product and service, employee's aesthetic traits, other customer's aesthetic traits
Marković et al (2021b)	Constructs: functional, mechanic and humanic Dimensions of construct functional: food and beverage Dimension of construct mechanic: facility Dimensions of construct humanic: service and experience
Marković et al (2021a)	Constructs: physical environment, food aesthetics and aesthetic labor Dimensions of physical environment construct: interior, exterior and ambience
Chen et al (2021)	Constructs: motivation, CoE (expectations), MTE, satisfaction, WOM, revisit intentions Dimensions of MTE construct: refreshment, involvement, hedonism, local culture, knowledge, novelty, meaningfulness
Park et al (2021)	Dimensions: food, service, atmosphere, value, green attributes, overall restaurant experience evaluation, behavioural intentions

Source: authors' research

Based on the processed data shown in Figure 2, it can be seen that the largest number of studies on the researched issues was conducted in Asia (36%) in countries such as Taiwan (44.45%), China (11.11%), Indonesia (11.11%), India (11.11%), Korea (11.11%) and Vietnam (11.11%). Asia is followed by North America (32%) and Europe (24%). In Europe, studies were conducted in Finland (50%), Croatia (33.33%) and Turkey (16.67%). A 4% research was conducted on the continent of Oceania in New Zealand. Only one study had an international sample (4%).

Table 1 chronologically presents research on a memorable sensory experience in a restaurant from 2017 to 2021.

As shown in Table 1, only 36% of studies contain all sensory components in examining the memorable experience of restaurant guests (Bekar, 2017; Cao et al., 2019; Kala, 2020; Liu & Tse, 2018; Marković et al., 2021a; Park et al., 2021; Richardson et al., 2019; Tsaur & Lo, 2020; Zhang et al., 2019). The previously mentioned components appear as dimensions and/or sub-dimensions called atmosphere, ambience and sensory experience, while in the remaining research sensory components such as sight and taste predominate. Taste and smell as representatives of sensory components are the focus of research by Ouyang et al. (2017) in the context of food aromas. On the other hand, Sthapit (2017) uses the dimension of local specialties and food attributes in examining the perception of restaurant guests about the taste of local specialties they tasted in a restaurant facility. Although in most studies the sound element was examined for restaurant guests through a single variable, in the Wen et al. (2020) study music is the main backbone of observation. Touch is the least represented as a subject of research on memorable experience of restaurant guests and does not appear as a separate construct, dimension, or subdimension but is mainly tested through one variable of the examining instrument in the table of the mentioned research. Also, based on the content analysis it was evident that the restaurant sensory component has a causal relationship with constructs "satisfaction" and "loyalty". More precisely, restaurant guest satisfaction is mentioned in 28% of studies, while "loyalty" (behavioural, attitudinal, and composite) is used in as many as 40% of studies included in the sample.

5. CONCLUSION

In the restaurant industry, sensory stimulation is crucial in achieving a memorable experience for restaurant guests. Given that restaurateurs are struggling to achieve the greatest possible competitive advantage in the tourism market, this review article will provide holders of this form of tourism with insight into the important factors for achieving a memorable experience for restaurant guests. The analysis found that the largest number of studies on this topic was conducted in Asia (36%) in 2019 (24%). Based on the content analysis, it was identified that in slightly more than one-third of the studies, all sensory factors were included in the examination of a memorable sensory experience in a restaurant. Also, a relationship between various constructs involved in 25 studies of the memorable sensory experience of restaurant guests was investigated, on the basis of which the following causal constructs of memorable sensory experience were identified: satisfaction and loyalty of restaurant guests.

Like any research, this one has also certain limitations. One of the limitations is the consideration of articles exclusively in English, so in the future research should focus on covering articles written in other languages as well. Also, in this study, the sample included articles only for the period from 2017 to 2021, consequently future research in the sample should cover a wider period of time. In the search of studies that dealt with the observed topic, only the world database Google

Scholar was used. For this reason, it is suggested that future researchers use other bases, such as Emerald insight and ScienceDirect. Given the scarce sample (N = 25), the proposal for future research is to include a larger number of articles in order to achieve better representativeness of the results. In order to accomplish the most detailed insight, it would be desirable to conduct analyzes according to the name of the journal and keywords cluster analysis. The contribution of this research is not only crucial for scientific experts but also has a great contribution for restaurateurs because based on the analyzed data they can get a more detailed insight into the tools used so far in examining the memorable experience of restaurant guests. Since the emphasis in this research is on sensory experiences, restaurateurs can use this to obtain relevant data with which they will be able to determine their strengths and weaknesses in the current business.

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The Famous Dealu Mare – Wine Route

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Abstract: *Wine tourism in the local vineyards is a new notion today. This tourism is starting to become an alternative to the late autumn holidays - you visit wineries, cellars, churches, everything is concentrated on a distance of only 60 kilometers.*

In the middle of the road between Bucharest and Brasov, on the border between Prahova and Buzau counties lies the homeland of red wine – "Dealu Mare"/ "Big Hill" vineyards. It has thousands of hectares of vineyards, eight famous wineries, and mansions that belonged to the old boyar families, some renovated and recently entered the tourist circuit, others in ruins, but just as spectacular. There are also 17th-century monasteries and themed museums that recreate the atmosphere of the houses in the area.

1. INTRODUCTION

Controlled wines with a designation of origin (CDO) "DEALU MARE" are the products obtained only in the perimeter of the "DEALU MARE" vineyard, geographically delimited. Dealu Mare vineyard represents the most cohesive wine massif in Romania. It has eight wine centers: Dealu Mare-Boldeşti, Dealu Mare-Valea Călugărească, Dealu Mare-Urlaţi, Dealu Mare-Ceptura, Dealu Mare-Tohani, Dealu Mare-Breaza, Dealu Mare-Merei and Dealu Mare-Zoreşti.

The controlled designation of origin "DEALU MARE" is attributed to wines obtained from grapes produced in the area delimited for this name. "DEALU MARE" wines owe their qualities and characteristics to the geographical environment, with its natural and human factors. They are obtained from grapes that come exclusively from the delimited area, from the varieties nominated belonging to the species Vitis vinifera and are produced in this area (Figure 1).

The "DEALU MARE" vineyard is located in the sub-Carpathian hills including hills and depressions between the Teleajen River to the west and the Buzau River to the east.

The vineyard is bounded on the north by the area of high hills and forests, and in the south partly by a corresponding limit for the Valea Călugărească wine center with the Ploieşti national road -Buzău and which, starting from Urlaţi to Buzău, retreats to the slope foot at a distance of 2-3 km north of the road (Boboc et al, 2015).

"DEALU MARE" vineyard is located between the north parallels 44°59 '- 45°32' and 26°02 '- 27°00' east longitude.

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The route reconstructs a small section of the old wine road used by the Romans 2.000 years ago, which crossed the continent from east to west, from the Black Sea to the Atlantic Ocean - Bordeaux region. In Prahova it crosses the localities of Mizil, Tohani, Ceptura, Urlaţi, Jercălăi, Valea Călugărească, Vărbila, Bucov, Seciu, Boldeşti-Scăieni, Zamfira, Plopeni, Băicoi, Floresti and Filipeştii de Pădure. By far the best known in Romania is the "DEALU MARE" vineyard, which extends over the territories of two counties and includes the wine centers Tohani, Ceptura and Valea Călugărească, in Prahova, and Pietroasele and Săhăteni, in Buzău. Feteasca Neagră, queen of the southern slope of the Istriţa hill, where most of the vineyards in Prahova stretch, is located on the same latitude as the Bordeaux region, offering exceptional climatic conditions, especially for the grape varieties from which the red wine is produced (Boboc et al, 2015).

From an administrative point of view, the vineyard is located on the territory of Prahova and Buzau counties.
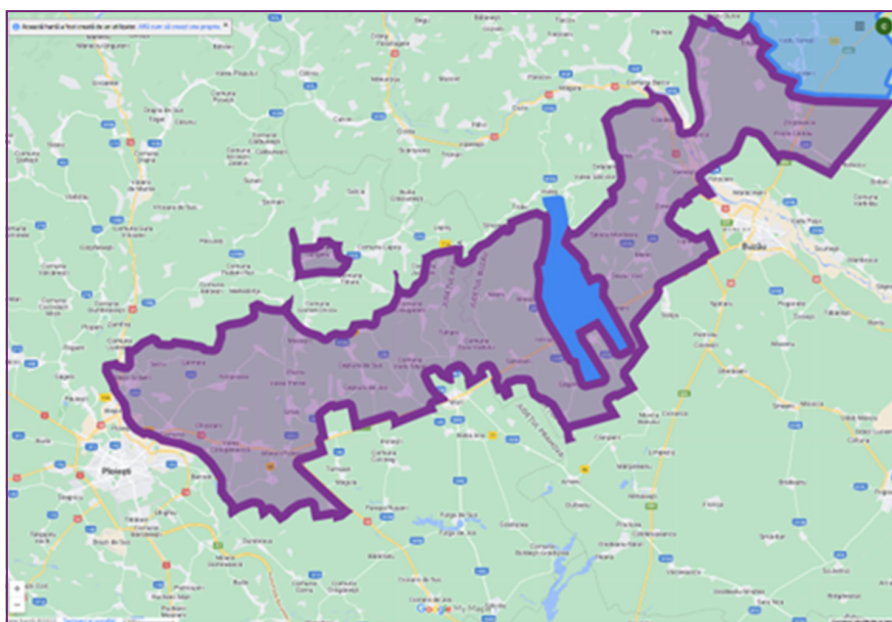
Figure 1. Dealu Mare geographical area

The existence of vineyards in this territory is confirmed by archaeological excavations, remains and toponymy that testify to the presence of vineyards since ancient times. Inside the large viticultural space that the vineyard forms, the following are delimited wine centers: Boldeşti, Valea Călugărească, Urlaţi-Ceptura, Tohani, Breaza-Buzău, Merei and Zoresti.

The first written documents about the existence of the vine culture in this part of the country date from the 14th and 15th centuries. From these documents, it appears that Ceptura, Valea Călugărească, Valea Mantei and Valea Popii were localities known and appreciated for the quality of the wines they were producing.

The most famous wine center, which emerges from documents of the "DEALU MARE" vineyard was "Cepturi", later "Cepturi", today Ceptura. Probably the vineyards of the Old Ceptures contained a viticultural area much larger than the one that belongs today to Ceptura village. In the past, the vineyard was harmoniously represented by the culture of a few varieties, distributed in a well-established proportion and produced a high-quality wine. Journey to the heart of the vineyards in the sunniest land of Romania, "DEALU MARE".

2.   RESEARCH RESULTS AND DISCUSSIONS

In the north, Prahova County borders Brasov County. The northern limit of the county starts from Omu peak (2505 m), passes through Diham peak, crosses Prahova valley and Azuga brook, reaches Paltinul peak (1900 m) from Gârbovei mountains, and then descends to Predeluș pass (1298 m). The northern limit continues through the Grohotis Mountains, crossing the ridge of Mount Ciucaș and descending towards the Tătaru Mountains.

According to NIS (National Institute of Statistics) data, Prahove country has a surface of 268.993 hectares. The agricultural area of the county is divided as follows: arable 142.872 hectares, natural pastures (69.167 hectares), natural meadows (39.464 hectares), vineyards (8175 hectares) and orchards (9.315 hectares) (https://insse.ro/cms/).

Borders. To the east, Prahova county borders Buzău county and its eastern limit crossing all forms of relief up to the plain starting with the course of the Siriu Mare brook and up to Boldești Grădiștea locality. The western limit, towards Dâmbovița county, starts from Omu peak (2505 m) and follows the eastern peak of the Bucegi Mountains, passing by Babele chalet, then descends under Păduchiosu Mountain and to the peak that separates Provița from Cricovul Dulce river, in order to reach the plain until the confluence of Cricovul Dulce with the Ialomița river. The southern limit of the county crosses the plain in the west-east direction and separates Prahova county from Ilfov county, in order to later follow the course of the Ialomița and Prahova rivers to the eastern limit near Boldești Gradiștea village.

The relief in Prahova County is very varied starting from the mountains, hills and plains arranged in a vast amphitheater. Moreover, there is the proportionality of landforms: 26.2% mountains, 36.5% hills, and 37.3% plains. The main mountains in the county are: Bucegi Mountains, Gârbova Mountains (Baiului), Grohotiș Mountains, Ciucaș Mountains and Tătaru Mountains.

The hills are an intermediate step between the mountains and the plain. The heights of these hills vary between 800-900 m and 300-400 m. The most important hills are: Talei, Gurga, Sultanu-Teisu, Campinitei, Cosminele, Bughei, Priporului, Salcia, Ciortea, Istrita, Bucovelul and Tintea.

In the southern part of the county, there is a plain with a height that varies between 70 - 200 meters. It can be mentioned as the high plain of Cricovul Dulce, the Ploieștilor Plain, the Vlasiei Plain and the Gherghiței Plain. The alluvium brought by the waters of Cricov Sărat and Prahova contributed to the formation of these plains.

From a geomorphological point of view, it is part of the great unit of the subcarpathian region, in which the vineyards occupy the hills' slopes and their depressions. The wine massif stretches over a length of about 65 km and has a width ranging from 3 to 12 km.

The natural setting. The lithology is represented by successions of gravel, sand and clay, of which sediments are solidified.

The Soil Map of Romania at 1: 200000 was presented in digital format including analytical data and a digital elevation model (DEM) with a resolution of 30 m; the map presented was created using the ArcGIS 10.5 Program. Figure 2 shows the "DEALU MARE" area. It includes the two counties: Prahova and Buzau (www.geo-spatial.org, http://www.opengis.org).
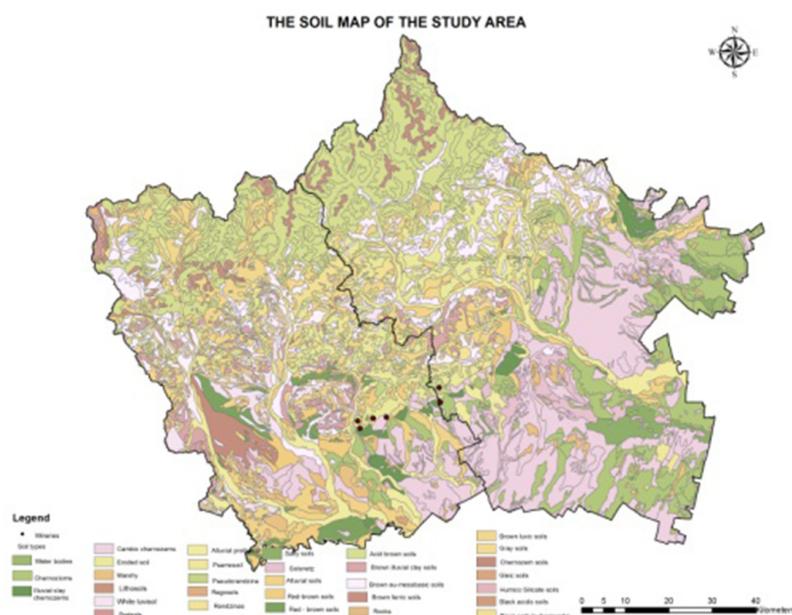
Figure 2. The soil map of the Dealu Mare vineyard

The soils. Within the vineyard, there is a great diversity of soils, due to the turmoil that the region has suffered and the phenomenon of erosion, which occurs frequently. The western part of the "DEALU MARE" massif presents soils formed on red clays, marls and in lower proportion on fine reddish sands. Alternations between clay layers and sand, inclined in the direction of the slope, cause landslides, and in the vineyard that is a frequent process. These soils, with a high content of iron oxides, are very suitable for the cultivation of varieties of red wines. The soils in the eastern part of the massif are based on Sarmatian limestones, clays, sandstones and dacitic tuffs, deposits of fine sands alternating with gravel formed from fragments of crystalline rocks, lehmuri and löess. As a genetic type, reddish-brown eroded forest soils predominate in the west, while in the east rendzines, pseudorendzines and, solidified sandy soils on a small area. In some centers skeletal soils are found, with the mother rock at a shallow depth and with a carbonate calcium into high content, which favors the production of aromatic wines. At the crossing to the plain there are chernozem soils, and in the north brown forest soils. Due to erosion processes, soil fertility is low (Irimia et al 2013), (Lobeanu et al, 1991).

Feteasca Neagră is known for its dark ruby color, slightly spicy taste with berry aroma. Cabernet Sauvignon wines can also be tasted in wineries in this area, with pepper and dark chocolate aroma, Tămâioasa Românească, golden-white wine, with lemon aromas, sophisticated Pinot Noir, aggressive Merlot, known for its strength, having 14% alcohol content.

In the wineries area Tohani, Ceptura and Valea Călugărească can be found wines from the Burgundy Mare, Bășicată, Riesling Italian, Pinot Gris, Sauvignon, Fetească Regală and Muscat Ottonel.

The Tohani Wineries are about 500 hectares of vineyards, here you can taste and buy wines from the varieties Fetească Neagră, Pinot Noir, Merlot, Cabernet Sauvignon, various special blends (red wines), Busuioacă de Bohotin (rosé wine), Fetească Albă, Fetească Regală, Sauvignon Blanc, Riesling, Chardonnay, Tămâioasă Românească, Shiraz, various special blends. There are wines from the 50s in the cellar, they cannot be tasted, but there is access to the wines from the 80s.

The young winery Budureasca, founded in 2013, covers a huge area of over 5.000 square meters. The winery is buried on three sides just to ensure a constant temperature for the wines. Five of the top ranges in the field can be tasted in the two special rooms. In addition to the tasting, assistance or help from an oenologist is possible. Tourists can take an outdoor tour of the winery and vineyard, as well as an indoor tour with access to the tank room and the barrel room.

The Urlati Domains are located on the same latitude as the famous wine-growing areas of Tuscany and Bordeaux. The domains are recognized for the quality of the wines from Fetească Albă, Sauvignon Blanc, Muscat Ottonel, Riesling, but also Fetească Neagră and Cabernet Sauvignon. You can also try wine wormwood of Urlați, Pelin Frizzante de Urlați (white, rosé) and Pelin de Urlați (white, rosé, red). Basilescu Winery, with a century-old tradition, is located in the city of Urlați and can be visited for wine tasting from top ranges such as Golem, Angels of Little Paris, Eclipse and Autentique. The oldest wines in the winery are from 2013. Urlățeanu Mansion, built in 1922 in the city of Urlați, was taken over at the end of the 90s by Halewood Winery. It is the first wine center that offered tourists the opportunity to visit a functional winery. The oldest wine that can be found in the winery is Cherry Tree Hill. (Irimia et al, 2013)

Rotenberg wineries, artisanal wines producer, are known for their wine produced exclusively by the traditional method, without any industrialization trace. Located between the village of Ceptura and Fântânele, the wineries are served by a vineyard that covers 18 hectares, mainly with Merlot. Here you can taste wine exclusively from the Merlot variety and buy the following wines: Merlot Emeriturs, Merlot Ceptura, Notorius Blanc de Merlot, Notorius Merlot, Notorius Rose, Menestrel Blanc de Merlot, Menestrel Merlot, Menestrel Rose, Rapsod Merlot, Rapsod Rose, but also some from the Owner's Reserve range (Merlot Emeriturs, Primus Ceptura). The oldest wine that can be found in the winery is the 2006 Rotenberg Classic.

The Serve winery, founded in the 1990s by Count Guy de Poix, is located in the village of Ceptura, and here were produced the first Romanian Cuvée and the first Romanian dry rose at the premiere in Romania. Tourists arriving at Ceptura can visit the vineyard, the winery, can participate in the tasting - the wines available are from the Knight's Wine, Terra Romana and Cuvée ranges - all these services being offered by a winery specialist. The oldest wine that can be found in the winery is produced in 1999.

Even if you have the impression that you went back in time, to the mid-1980s, it is still worth a stop at the Valea Călugărească Research Institute. Here you will find passionate people, who are trying to keep what is left of the old Romanian wine industry. Being a research institute for viticulture, you will be able to discover unique, hybrid grape varieties produced by specialists. The star of the place is "aromatic black", a grape variety dedicated exclusively to red wine, already a star in the world of local viticulture, and highly appreciated in specialized competitions. This grape variety produces the only red and aromatic wine in Romania. The trade name of the wine obtained from "aromatic red" is Olivia, a wine that you cannot find in stores, but exclusively at the institute in Valea Călugărească (Matei-Radoi et al, 2011).

3.   CONCLUSION

Vineyards represent a way of economic capitalization of the less fertile lands of hills, but also a way to protect and enhance the environment, without affecting its integrity. The white wines from the "DEALU MARE" vineyard stand out for their extractives, a balanced structure and

good acidity, imprinted by the south-eastern exposure of the slopes, but also by cultural practices, which keep production at moderate levels. The red wines obtained in "DEALU MARE" are known for their finesse, light tannins and vivid color, as is the case of the Valea Călugărească and Urlaţi wine centers, where the influence of soils brown-reddish, rich in happy salts is obvious. At the same time, in other famous centers such as Ceptura, Tohani, Merei, red wines are more robust, vigorous, with increased color intensity, characters imprinted with extra heliothermal resources and light-textured soils.

In this area are planted vineyards types adapted to the specific conditions of the soil and the exposure of the slope. The soil type and the slope exposure determine the "DEALU MARE" wine characteristics.

The area delimited for CDO (controlled designation of origin) "DEALU MARE" falls within the wine-growing zone C II, according to Order 645/2005 regarding the approval of the classification of the Romanian viticultural regions in the viticultural areas of the European Union. The wines produced in this area have specific characteristics and a reputation that can only be attributed to this area. Grapes are found in 100% of this geographical area. Oenological practices and treatments are carried out according to the legislation in force. The wine produced in the area delimited for the protected designation of origin "DEALU MARE" has an alcoholic strength by weight of at least 11% vol., depending on the quality of the grapes' harvested sugar content.

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The Wine Routes in France

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Abstract: Wine is much more than a simple agricultural product or a vague raw material that is traded on the markets of London or Chicago. Wine accompanies, enhances, completes and sometimes sublimates our table. However, it cannot be confined to the gastronomy sector alone because it is much more than that. Wine has a cultural, historical and heritage dimension, it also occupies a decisive place in the economic and social fields. France and wine... A long story that has caused a lot of "ink to flow". It was the Greeks who, around 600 BC. AD, planted the first vines in southern Gaul. From the 2nd century BC. AD, the Romans and then the Gallo-Romans gradually developed wine production throughout the territory of present-day France. During the Middle Ages and the centuries that followed, the wines were perfected. This movement resulted in the emergence of very different beverages, which current producers continue to improve.

1. INTRODUCTION

In France, viticulture is located in certain regions, on well-defined territories. It is from geography, history and terroirs that wine diversity has been built. Since the first establishment of the vine, in the south of France, and its development throughout Gaul by the Romans, wine-growers have sought the plants that were best suited to the climate and the soil to always obtain a better wine. Today, each region has its particular characteristics and wines. Appellation d'origine contrôlée (AOC) means that wines are produced in delimited areas and subject to strict and precise regulations defined according to "local, loyal and constant customs". AOC wines are identified with the cultural products of a specific region, with its landscapes, history, wine-growers and their know-how. AOC wines have been very successful; there were 70 in 1935, and there are more than 470 today (https://www.lecese.fr).

Today, in the context of globalization, new tastes are being expressed. Varietal wines and local wines were then developed and currently many new categories are available to consumers (http://www.winepassport.fr/fr/page/route-des-vins-et-tourisme-viticole-decouvrez-nos-sejours-256).

New consumers, both on the international market and the French market appreciate wines with a good image, guaranteeing a uniform taste and displaying a fair price. Some consumers also ask for fruitier and more aromatic wines. Other countries (Chile, Australia, Spain, Italy, etc.) have risen to this challenge and won significant market shares replacing the French producers. French viticulture benefits from all the necessary potential, through its public and professional research structures, to market wines that are more suited to the demand of new consumers and to position itself more forcefully on the markets.

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In recent years, numerous initiatives have been developed in the wine regions: cultural routes, direct sales, tasting courses, celebrations and festivals, etc. It is worth emphasizing the essential role of restaurateurs in the knowledge and distribution of wines provided that they remain at affordable prices. More and more, viticulture professionals are showing their strong desire to get involved in this new niche as tourists are there.

To make themselves better known to consumers, viticulture professionals have created tourist itineraries allowing travelers to reconcile the pleasures of discovering their treasures and regions. In France, the number of wine tourists is estimated at 5 million French people and 2.5 million foreigners (survey by Atout France). Many tourist routes crisscross the vineyards of France. Between the 140,000 cellars and the thirty museums, these routes allow one to taste wines, and meet professionals in the area, but also to appreciate the local landscapes and architecture; this is how wine tourism was created in France (Gaubert-Turpin et al, 2021, (https://www.vinotrip.com/fr/route-des-vins).

Aromas, perfumes, and colors… The wine route is above all a multi-sensory experience. In 2016, more than 10 million tourists practiced wine tourism by discovering the wines of France. The term "wine tourism" refers to wine tasting, but also to visiting the cellars, and accommodation that offers immersive stays in the heart of the vineyards (Gaubert-Turpin et al, 2021).

2. WINE ROUTES

The French vineyard has been established for centuries, in some regions for several millennia. The notoriety of these wines has been built on the diversity of terroirs and grape varieties, which has given rise to numerous wines with designation of origin, some of which have become legendary. These wines, and all the other less famous but just as typical, carry the characteristics of their region, both geological, climatic, and human, as well as the wine-growing landscapes which have been shaped over time, are part of the tourist and cultural heritage from France (https://www.routard.com/contenu-dossier/cid136048-les-routes-des-vins-en-france.html).

2.1. The Loire Valley Wine Route

Vineyards of France cover the Nantes region, Anjou, Touraine and the Centre. The perfect opportunity to delight taste buds while visiting the castles! The temperate climate that reigns in these regions is the ally of Muscadet and Chinon.

Characteristics of the vineyards: surface area of 63,000 ha, 5,009 farms, 68 appellations (52 AOC and 16 VDQS).

Five grape varieties cover nearly most of the grape varieties:
- In blacks: Cabernet franc (52%); black Gamay (16%).
- In whites: Melon (39%); Chenin (27%); Sauvignon (20%).

There are many names. For red wine: Anjou (including rosé d'Anjou), Cabernet d'Anjou, Touraine, Chinon. For white wines: Muscadets, Sancerre, Touraine, Vouvray. More than three-quarters of the surface area of the vineyard is devoted to AOC or VDQS wines. It is the third vineyard of appellation wines in France.

2.2. The Champagne Wine Route

Only the pinot noir, chardonnay and pinot meunier grape varieties, lovers of limestone soils, deserve to receive this royal name. To discover the great houses with names that make one dream, one has to travel the roads between Reims and Épernay. From the Saint-Thierry massif to the Montagne de Reims, a plateau strewn with vines awaits its tourists!

Characteristics of the vineyards: area of 32,341 ha, 11,670 farms, 1 AOC.

The expression "wine of champagne" appeared around 1600, before the wines of the coasts around Reims were marketed under the general name of "wines of France".

Champagne is a legendary product. It is a festive wine, which is drunk on the occasion of significant life events or is drunk to highlight and promote certain events (sports, politics, boat launches, etc.) and to maintain its own fame.

The Champagne myth would result from the conjunction of three assets: its terroir (northern climate, chalky subsoil, relief of hillsides), a blend of wines from different grape varieties, vintages and even years, which makes it possible to have consistent quality and taste, mastery of effervescence.

Originally, there would have been a local sparkling wine, the "tocane" of Aÿ. At the end of the 17th century, the people of Champagne put their wines in bottles to better preserve and transport them. The natural effervescence was gradually brought under control.

The grape varieties are Pinot noir (39%), Pinot meunier (33%), Chardonnay (28%). Mechanical harvesting is prohibited because the grapes must arrive intact at the press, in order to prevent the colour contained in the skin of the black grapes (Pinot noir and Meunier) from colouring the must. The grapes are pressed, vintage by vintage, variety by variety. It is at this time that most of the harvest is taken care of by the Champagne houses. Champagne vineyards are small: 2.72 ha of vines, on average. They are the smallest among French wineries. A third has an area of fewer than 50 areas, and 15% have an area of between 50 areas and 1 ha. The Champagne vineyard employs 122,000 seasonal workers, mainly for the harvest, on average ten days a year. The Champagne region is also characterized by a very large grape market since it concerns more than 50% of its production. A partnership exists between winegrowers and merchants and this thing limits imbalances between supply and demand.

2.3. The Alsace Wine Route

On the podium of white nectars proudly dominate the Sylvaner, the Riesling and the Gewurztraminer whose identities differ thanks to the diversity of the soils of the region. From Haut-Rhin to Bas-Rhin, there are flowery villages and medieval towns. Invented in 1953, the "Alsace wine route" is the oldest in France. For more than 170 kilometers, it winds along a north-south axis through hills covered with vineyards. Located on hills, the Alsatian vineyard is sheltered from oceanic influences by the Vosges mountains and enjoys plenty of sunshine. It is about a hundred kilometers long and covers approximately 15,000 hectares spread over 119 municipalities.

Characteristics of the vineyards: surface area of 15,450 ha, 5,150 winegrowers, 3 AOCs.

After the First World War, winegrowers began to produce white wines made from typical grape varieties: Riesling, Pinot Gris, Gewurztraminer, Muscat d'Alsace, Sylvaner, Pinot Blanc, Klevener. To this list, Crémant d'Alsace must be added, which stands out for being sparkling, and the Edelzwicker, which is a blend of several grape varieties. Pinot Noir is the only red or rosé variety in the region. These wines obtained their controlled designation of origin (AOC) in 1962. There are three of them: Alsace, Alsace grand cru, Crémant d'Alsace. Marketed in an exclusive type of bottle, the Alsatian flute, wines from this region are normally drunk in long-stemmed tulip glasses.

The producers, for their part, provide one with tasting cellars. Marked by signs and information terminals, this road gives access to 38 wine trails, also dotted with information panels. Crossing the vineyards, these paths lead up the hills where breathtaking views await.

2.4. The Burgundy Wine Route

In Burgundy, one finds the prestigious route des grands crus which takes from hill to hill from Dijon to Santenay. The Burgundy wine family extends its territory between Auxerrois and Mâconnais.

Characteristics of the vineyards: area of 30,600 ha, 3947 farms, 101 AOC.

From the grape varieties, which are mainly pinot noir, chardonnay, gamay, aligoté, we get red, white and rosé (clairet) wines. It was the monks who, in the Middle Ages, began to structure wine production, creating "clos" (properties) and "climats" (specific production areas) around their abbeys; the best known being Cluny and Cîteaux.

The Dukes of Burgundy and the Kings of France then reinforced these bases on which the Burgundy wine-growing economy still largely relies today, to which four thousand estates all highlight their characteristics (subsoils, microclimates, etc.). The Burgundy wine archipelago has four major tourist routes that can be followed separately or continuously. Next, they are presented in the north-south direction.

The "Yonne vineyard route" crosses as its name suggests, through the Yonne department. One of the main wines of this course is Chablis.

The "route des grands crus de Bourgogne" is considered to be a royal route. It crosses the part of the Côte-d'Or where the most prestigious vineyards are located. After visiting Dijon, one reaches the old village of Marsannay, then the canton of Gevrey-Chambertin and the vineyards of Nuits-Saint-Georges where the castle (12th century) of Clos de Vougeot is, the seat of the famovus Brotherhood of Tastevin (the tastevin is the cup in which the wine is tasted in the cellar). Then there are Côte de Beaune, Pommard, Volnay and Meursault...The "route des grands vins" extends from Santenay. To Saint-Gengoux-le-National, it makes one discover the Chalonnaise coast passing from one charming village to another: vineyards, bocage, Romanesque churches, castles, Canal du Centre...

The "Mâconnais-Beaujolais wine route" takes one to Saône-et-Loire; it is lined with "Follow the cluster" signs. This is where the wines of Mâcon come from, Pouilly, Saint-Véran,

Passetoutgrain, Viré-Clessé (many are white wines, juliénas, chénas, windmill, fleurie, chiroubles, morgon, régnié, côte de brouilly, brouilly), sometimes associated with the divine Burgundian beverages, and other times considered separately. Beaujolais is largely due to the Gamay grape variety. From Saint-Amour to Lyon, 140 km of vineyards are spread over a multitude of different soils.

2.5. The Rhône Valley Wine Route

These vineyards invite one to explore lavender fields and hills and set off on an adventure through six departments. From Avignon to Vienne, the Rhône serves as a breadcrumb trail. In this way, one can feel the taste of a red Châteauneuf du Pape from the Domaine de Fontavin, or try a white Saint-Péray with a floral scent.

Characteristics of the vineyards: surface area of 79,870 ha, 6,800 farms, around twenty AOCs.

88% of AOCs in the Rhône Valley (94% of Côtes du Rhône) are red wines, 8% rosé and 4% white. Whether for the AOC wines of the Rhône Valley or for the AOC wines of the Côtes du Rhône alone, the cooperative cellars represent more than 60% of the production, the private cellars of the order of a third and the wine merchants, about 3%.

2.6. The Provence Wine Route

From the Alpilles to the Esterel massif, the Provençal vineyard stresses the importance of generous rosés. The three dominant appellations are Coteaux d'Aix-en-Provence, Côtes de Provence and Coteaux Varois. For lovers of marine scenery, the southwest of the Massif des Maures invites one to taste a Côtes de Provence La Londe.

Characteristics of the vineyards: the surface of 90,972 ha, 7473 farms.

The main black grape varieties used are Grenache (44%), Syrah (16%), Carignan (12%) and Cinsault (9%).

Among the VQPRD, mainly red and rosé wines, the main appellations are the Provençal part of the Côtes du Rhône, the Côtes de Provence; then come, with a smaller share, the Côtes de Ventoux, the Coteaux d'Aix and the Côtes du Luberon.

The region's VQPRD production amounted to 2.868 million hl, including a large proportion of local wines (vins de pays from the Var, local wines from the Portes de la Méditerranée, Vaucluse, Bouches du Rhône, of the Moors, of the Principality of Orange).

2.7. The Languedoc-Roussillon Wine Route

The vineyards of Banyuls offer exceptional natural sweet wines in a dazzling atmosphere between the Mediterranean and the Pyrenees. The vine has been present in the region since Roman times. But it is from the 19th century that the conjunction of several factors - a fall in the price of wheat, and the building of the railways - will allow the shipment of wines to the consumption centers. A more remunerative wine price will lead to rapid development of the vineyard, the area of which will reach 450,000 ha in 1860 (260,000 ha in 1840).

It was in 1874 that phylloxera (aphid that attacks the roots of vine stumps) appeared in the Gard. The vineyard was rebuilt thanks to the grafting of French grape varieties on American plants.

Characteristics of the current vineyard: area of 268,188 ha, 19,106 farms.

The vineyard lies down from the eastern edge of the Cévennes to the eastern Pyrenees, on a wide variety of soils and terroirs (schist soils, limestone, stony terraces, alluvial plain...). Langued-oc-Roussillon alone produces 80% of French table wines. It provides some 30% of the French wine harvest. It is the world's largest vineyard, despite the loss of 150,000 ha following successive uprooting in the 1980s.

2.8. The Bordeaux Wine Route

Behind the name, "Bordeaux wines" hide some of the most prestigious appellations in the world, such as Pommerol or Saint-Emilion for red wines. Among the itineraries on offer, choose the castles, and route in the Médoc. Bike paths and trails lead to Château Margaux, the flagship location of the vineyard.

In spite of the French national pride suffering, one must admit that it is to the British that we owe the rise of Bordeaux wines. When Aquitaine was under their domination for much of the Middle Ages, they got into the habit of tasting Clairette, a light red wine, and thus favored local viticulture and trade.

Characteristics of the vineyards: the surface of 121,496 ha, 9863 farms, 57 AOC.

The reds are very popular, but the region also produces dry or sweet white and rosé wines made from red grape varieties. The latter, for the most part, are Cabernet Sauvignon, Cabernet Franc and Merlot, while the white wines are mainly made from Sauvignon Blanc, Sémillon and Muscadelle grape varieties.

Bordeaux has more than fifty controlled designations of origin, thousands of châteaux (properties) and hundreds of trading houses; it has been calculated that wine-growing provides one in six jobs in Gironde. Some of its wines are among the most prestigious in the world: Pétrus, Yquem, Mouton Rothschild, Cheval Blanc, Laffite-Rothschild, Latour, Margaux.

Taking advantage of the humidity brought by the Atlantic Ocean, the 120,000 hectares of Bordeaux vineyards enjoy a temperate climate (short winter). They are discovered through five tourist routes dotted with wine houses. Their starting point is of course Bordeaux, the streets of its very elegant city center should be explored: already a pretty road to walk on. The Route du Médoc, between the north of Bordeaux and the Pointe de Grave. This is where one finds the Grands Crus Classés and quite a few Crus Bourgeois (Pauillac, Saint-Estèphe, Saint-Julien, Margaux, Moulis, etc.). For the pleasure of the eyes, one has castles and prestigious residences. The Saint-Emilion-Pomerol-Fronsac road is located east of Bordeaux, on the right bank of the Dordogne. The vineyards crossed are those of Saint-Émilion, Fronsac, Côtes de Castillon, Côtes de Francs.

The Blaye and Bourg road north of Bordeaux runs through Blayais and Bourgeais (Côtes de Blaye, Côtes de Bourg, etc.). The Route des Graves, southwest of Bordeaux, runs through

vineyards on the edge of the Landes forest. This micro-region forms the cradle of Bordeaux. The Entre-deux-Mers road runs southeast of Bordeaux in the region, that is to say between Dordogne and Garonne. The wines here are red as well as rosé and white (Cadillac, Haut-Benauge, Loupiac, Sainte-Croix-du-Mont…).

2.9. The Corsica Wine Route

Endowed with numerous microclimates and soils, the Corsican territory displays its oenological flavors all along its coast. To find the wine route, nothing could be simpler: just follow the coast. To the north, taste the Muscat from Cap Corse, and to the south, the wines of Figari. The splendid landscapes are a bonus!

Characteristics of the vineyards: the surface of 6800 ha, 205 farms, 9 AOCs.

The area of the Corsican vineyard is 6,800 ha, a constant figure for several years (it reached 30,000 ha in the 1960s, at the time of the arrival of returnees from Algeria). The AOCs have extended over just under 3,200 ha, the highest level since 1980. The main grape varieties used are, black: Nielluccio, Merlot, Sciaccarellon, Grenache, Syrah; white: Vermentino, Chardonnay, Muscat à petits grains, Chenin, Muscat d'Alexandrie. The local market is an outlet for 70% of the AOC production and for 30% of local wine production. The cost of Corsica-continent transport is a minus.

3. CONCLUSION

The development of wine tourism has a double purpose: to offer an additional source of income to winegrowers and to develop the promotion of wine. Indeed, closer to the production, the consumer is the best to appreciate the wine, the life way, and the conviviality that is attached to it. Wine tourism is a way to promote both wine culture and heritage.

Viticulture is an essential support for tourism and gastronomy in all regions of France. Strong in its traditions and with the support of its research, widely noticed around the world, it must also evolve and adapt for sustainable development and practices that respect the environment.

All together, citizens, professionals, and public authorities have to take up the challenge of competitiveness, while preserving the authenticity of the vine and the wine so that France is always the first wine-growing country in the world.

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The Right to the Personality of Older Persons and Their Freedom in Relation to the Administration

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Abstract: *New technologies offer a world of possibilities in all areas of citizens' lives, so the Administration, therefore, has not been excluded from their integration. However, the implementation of ICTs poses a great challenge caused by the inexcusable need to provide technological, economic, and training resources (digital skills) that are required for their effective operation. That is why the rights of citizens must remain unscathed before its implementation, overcoming any obstacle that arises and even maintaining the freedom to use or not, and much more so if they are vulnerable citizens, either due to their age or lack of means.*

1. INTRODUCTION

Information and Communication Technologies (ICTs) provide us with a diversity of possibilities in all contexts of our lives (social, health, economic, etc.), opening up a wide range of rights for European citizens in their communications with the Administration since the approval of Directive 2006/123/CE of the European Parliament and of the Council of December 12, 2006[2], relative to services in the internal market. However, for it to be a reality and an effective right, citizens must have the appropriate technical infrastructure that serves as the basis and support to be able to carry out its use. Likewise, for their use and exploitation to be efficient, we must also take into account the situation of all sectors of the population, especially the most vulnerable, since the prior training that is necessary for the use of these technologies can be a barrier for our elders, especially those without resources or with disabilities. After years of implantation of new technologies, the urgent need to eliminate the digital gap of the elderly is detected, especially, analyzing the needs that derive from the obligatory implantation in some fields of such technological advances and even more, after the Covid-19 pandemic, where most of the administrative procedures have been established digitally, obviating the accessibility obstacles of this highly vulnerable group, undermining their rights and inexorably causing their marginalization.

After the Covid-19 pandemic, access through this means has become general, indirectly forcing all citizens to use it as the only access route. Given this situation, it is proposed from these lines to make an analysis of the implementation of telematic procedures to a global level; study the consequences that occur in the rights of citizens in their relationship with the Administration electronically, and the damages produced by such demands.

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[2]   Directive 2006/123/CE of the European Parliament and of the Council of December 12, 2006 on services in the internal market (published in DOUE of December 27).

2. THE INTERNATIONAL EVOLUTION OF THE RIGHT TO FREEDOM OF OLDER PERSONS IN ITS RELATIONSHIP WITH THE ADMINISTRATION

The right to freedom, understood from the literal meaning of the word as an attribute, means independence to do or decide what is deemed convenient and that includes any person without distinction of any social circumstance (age, sex, ideology, etc.) because they are an inalienable condition of the human being; and from the legal point of view, freedom is the faculty or power to act according to their criteria within the framework of the Law[3], both from the point of view of wandering and of choice in the exercise of their preferences.

The Universal Declaration of Human Rights (UDHR), adopted by the United Nations General Assembly in Resolution 217 A(III), on December 10, 1948, in Paris, was born with the aim of protecting human rights injured by wars that had been happening, especially as a reaction to the violation of human rights during World War II. A pioneering international instrument in the protection of human rights is formed based on the recognition of human dignity as the basis of the most essential values of the human being such as freedom, justice, and peace, as established in its preamble.

The International Covenant on Civil and Political Rights (ICCPR), approved by the United Nations General Assembly in Resolution 2200 A (XXI) of December 16, 1966, was already configured in its preamble in accordance with the principles of the United Nations Charter, recognizing freedom as the basis for recognizing human dignity. Article 9 generally recognizes this right.

Years later and after a process of democratization of the States, in a schematic way and not to extend ourselves excessively in the field of recognition of freedom, we find ourselves in the European sphere with the Charter of Fundamental Rights of the European Union, approved in the year 2000[4], where freedom was recognized, already in its preamble, as a general situation and inherent to every person (personality right) and introduced as a value of the Union, inalienable as it is the basis and axis of the rights that make up human dignity, although at first it was considered a declaration of moral principles, over time it was incorporated through successive documents with binding force, thanks to the will of the States.

Likewise, article 41 recognized the right to good administration within the category of fundamental rights[5]. This new recognition of the Charter is postulated as the first of all legal instruments, both national and international, on human rights. Starting from the recognition of both concepts, freedom-good administration, the problem lies in the convergence of actions derived from respect for the freedom of all, especially that of our elders, in the exercise of their rights and the actions of the Administration in good governance[6] in the achievement of its functions, in an agile and efficient manner, putting its actions at the service of the general interest. Subsequently, with the approval of the Treaty of Lisbon, it maintains in its article 6.1 of the TEU, the

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recognition of the Charter, giving it binding legal value, recognizing in the community environment the rights, freedoms, and principles of the text, for which it grants it the same value as to the Treaties.

Consequently, some reference can be observed in defense of the good performance of the Administration: in the Judgment of the Court of Justice of October 18, 1989, in matters of protection of competition in case of administrative procedure, arguing the right of defense of any procedure when it can end in an act harmful to a person, constituting it as a fundamental principle, brewing through the European jurisprudential doctrine the notion of good administration as a generic concept, so that good governance was forged as a standard of behavior required from the Administration[7].

But the obligation to observe a good Administration of the States in their internal functioning was based on the Charter of Fundamental Rights of the European Union as the first identification of European fundamental rights[8], as a consequence on the part of the Governments of the Member States, of guarantee of protection of the fundamental rights of citizens, although in legal systems it will not be reflected as such, but as behavior of the Administration that must be observed.

Good governance appears in the European context in the approach to ICTs in their management and communication with citizens. It is therefore that the promotion of electronic administration begins as a community commitment that begins with the Council of Europe, to take advantage of the possibilities offered by new technologies. In the year 2000, at the Lisbon Summit[9], it was proposed, through the eEurope program[10], to make the EU the strongest power in terms of knowledge through Internet connection.

A year later, the European Commission defined it in its White Paper on European Governance[11] (2001), as the set of rules, processes, and behaviors that affect the exercise of power in Europe in terms of responsibility, effectiveness, coherence, and stake[12].

In 2004, the OECD[13] published a study "Electronic administration: an imperative", highlighting the kindness of the application of Electronic Government in terms of the savings that electronic

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[7] Ibidem… p. 428-429.

[8] "…A generic reference to good administration could be observed in the Declaration of the Rights of Man and of the Citizen, adopted by the French Constituent Assembly on August 26, 1789. "society has the right to demand an accounting of its administrative action from every public agent", establishing it as a rule, not as a right". Tomás Mallén, B. (2004). El derecho fundamental a una buena Administración. *MAP-INAP, Madrid 2004. P. 179.*

[9] Portal of the European Union. http://publications.europa.eu/resource/cellar/ade37b54-018f-45a6-bf48-95ff11598b1f.0005.02/DOC_2 (accessed May 5, 2022).

[10] "…eEurope is a political initiative aimed at ensuring that future generations of the European Union take full advantage of the changes that the information society is producing."Portal of the European Commission. "eEurope, an information society for all, Initiative". https://cordis.europa.eu/programme/id/IS-EEUROPE/en (accessed May 1, 2022).

[11] The White Paper on governance, approved by the Commission on July 25, 2001 (published in DOUE on October 12).

[12] Garrido Mayol, V. (2020). El principio de buena administración y la gobernanza en la contratación pública. *Estudios de Deusto: Revista de la Universidad de Deusto*, *68*(2), 115-140.

[13] OECD Portal. The Electronic Administration: an imperative". https://www.oecd-ilibrary.org/governance/the-e-government-imperative/summary/spanish_9789264101197-sum-es (accessed 25 April 2022).

administration can generate and its effectiveness. In this same year, the Committee of Ministers adopted a recommendation on democratic governance highlighting the notoriety of electronic administration not as a technical issue.

At the Seville Summit, the eEurope 2005[14] Plan was approved with the purpose of advancing its objective of creating an electronic environment. On April 25, 2006, the European Commission launched the Action Plan on Electronic Administration[15], also known as e-Goverment (as part of i2010) outlining the steps to develop electronic administration, thus initiating the society of EU information with three key objectives: to achieve a single European information space, to strengthen innovation and investment in the field of ICT research and to achieve an information society based on inclusion. In short, this objective was intended to improve public services and the quality of citizens in a coherent and sustainable way, seeking maximum efficiency from new technologies as a determining economic factor.

On December 12, 2006, Directive 2006/123/EC (in the aforementioned introduction) was approved, establishing the obligation of the Member States to facilitate the electronic means necessary for access to procedures related to service and information activities.

In 2014, the OECD[16] published a document with Recommendations for the development of Digital Administration Strategies. The document contained 12 guidelines to be taken into account in the development of Digital Administration Strategies by the countries. Its objective was for administrations to get closer to their citizens and companies by making use of new technologies, widely rooted in society.

And from here a large number of international and community instruments support the use of electronic media as essential for its benefits in terms of the operation of good governance. However, the intended objective, as can be elucidated, is the establishment of a new channel that facilitates the efficiency of the Administration in the exercise of its powers, as a modern public service[17] that helps citizens in their access, but nothing indicates that it should serve as a filter, much less as an obstacle in the exercise of the rights of citizens since its inclusive nature of help in search of the general interest of the citizen is easily deduced.

3. THE INCLUSION OF NEW TECHNOLOGIES IN THE FIELD OF ADMINISTRATION

3.1. Principles, Characteristics, and Objectives of Electronic Government

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[14]   eEurope Plan: An information society for all. https://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:52002DC0263&from=ES (accessed 25 April 2022).

[15]   PAE, Electronic Administration Portal: Action Plan on Electronic Administration. https://administracione-lectronica.gob.es/pae_Home/pae_Estrategias/pae_lineas_ccoperacion/pae_Cooperacion_Internacional/pae_estrategias_de_administracion_electronica/pae_Ambito_Europeo_Planes_accion_administracion_electronica.html (accessed 20 April 2022).

[16]   OECD Portal.
        https://administracionelectronica.gob.es/pae_Home/pae_Actualidad/pae_Noticias/Anio2014/Agosto/Noticia-2014-08-12-Recomendaciones-OCDE-estrategias-Adigital.html (accessed May 12, 2022).

[17]   "By administrative activity of public service we understand that the Administration provides benefits to citizens to guarantee the satisfaction of their needs. The essence of public service...is not the exercise of power, but the provision of benefits for what is mainly carried out by the Administration..." Rebollo Puig, M. y Vera Jurado, D. J. (2019). "*Modos y medios de la actividad administrativa". Derecho Administrativo. Tomo III*. Tecnos. pp. 127-133.

We must not forget that to carry out any change in a means of communication or access between citizens and the Administration we must take into account a series of factors that may affect its achievement in some way. Among the factors that we can distinguish that have the greatest impact, first of all, due to its importance, we must highlight the freedom to choose the access channel. The Administration must verify that the channel is adequate and that it guarantees effective two-way communication between the parties, this implies digital updating on both parties, Administration-citizen, either because they have the appropriate technical resources and, above all, because they are competent in terms of its digital capacity so that effective communication can be ensured.

Although the Electronic Government is understood as a new technological system based on information and communication whose fundamental objective is to achieve an agile and safe administration for all and thus reduce the Administration's expenses; It must be verified that the means and channels used do not diminish any fundamental right, including freedom and much more when it comes to older people, with a situation of special vulnerability due to lack of economic or technological resources or lack of digital literacy. It is essential that the Member States take into account when applying their new communication models, that their procedures meet the optimal requirements so that citizens receive them in equal conditions. It is indeed a new and agile tool for a large number of users, but it is also true that it can lead to the violation of some fundamental rights in certain sectors of the population, those with inadequate or even non-existent technological possibilities, generating by this a significant digital divide and dire consequences.

It is indisputable that the use of information and communication technology represents a great advance in the optimization of resources in public management, as well as the development of policies and strategies aimed at the citizen, but it must be observed that the economic and Administration technicians do not correspond to those of all citizens, as it is a heterogeneous subjective element due to diversity of social circumstances. It is necessary for the Administration to foresee the obstacles that arise with the use of ICTs in the automation of procedures and services as the only way of access, and much more, after the Covid-19 health crisis, when their use increases exponentially, generating an important dysfunction in the older group due to not being prepared for the change, since its establishment occurred at great speed as a protection measure against personal contacts to avoid contagion. However, after the passage of confinement and subsequent restrictive measures where telematic procedures were promoted as a priority, the truth is that this situation has been maintained in many procedures as the only means of access to the Administration.

As anticipated in previous lines, the introduction of ICTs in the Administration must take into account a series of basic factors for its implementation. In addition to the channel used, the following must be taken into account: the literacy of citizens in terms of the use of telematic tools, including all social groups, especially the older ones, as they are the most vulnerable; the technological infrastructure possessed by the recipients; established web platforms (secure in terms of data protection) that do not cause mistrust; an intuitive and simple interface that does not generate rejection in its use; standardization of portals as single windows so that all Administrations are connected and do not need different applications, or user registration, just one and that is a tool that generates trust, since in general, from that website, they can carry out all kinds of procedures, thus avoiding establishing a barrier with citizens due to its diversity of applications, the uncertainty of facing the new medium and especially the inclusion of the elderly[18].

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[18]   Rodríguez, G. (2004). Gobierno electrónico: hacia la modernización y transparencia de la gestión pública.

In short, the characteristics that the Electronic Government must have for its correct implementation and taking into account that its competence is a public service, are:

- Adequate digital receiver and transmitter, so that in this way an effective channel of communication in the exercise of the rights of citizens, of all, is widely possible. This implies that it will be the Administration that must adapt to the level of the users and not the other way around since it is the Administration that is at your service.
- Simple to use, since it must mean an increase in integrated possibilities in the range of sectors to which it will be directed, providing the Administration with standardized, intuitive, clear and easy-to-use interfaces that invite users to use them. It is essential that the constant extensions and modifications of the Administration's website do not imply an obstacle in its access.
- Flexible, not being the only means of communication with the Administration to carry out a specific task, but rather it is established as an agile, simple, comfortable possibility, so that the user can freely choose the most appropriate means, both face-to-face and telematic.
- Insurance, through its use the Administration must guarantee the protection of citizens in all contexts, data, economic, etc.
- Free or that a discount be established when appropriate (public prices, fees...), as this will encourage its use.
- Single window, with the intercommunication of the different Administrations in a general way and the user not having to constantly install specific applications that require a variety of technical requirements, passwords, etc.

The fulfillment of these characteristics referred to in the use of ICTs through the so-called Electronic Government, aims to establish good governance suitable for all levels of society, promoting a cultural and technological change related to the times, adapting the Administration to the digital transformation demanded by society. The establishment of new means of communication and access to the Administration through new technologies must be inclusive for all citizens, especially taking into account the most vulnerable, being aware of the technological reality of all, so that progress in this new innovative access process really meets the intended objective and is covered by the conviction of being at the service of citizens by improving the quality of their lives and their protection.

3.2. Advantages and Disadvantages in the Exercise of the Rights of the Elderly Through ICTs

The right to electronically access Public Administration can give rise to innumerable consequences, both positive and negative.

- In the first place, in terms of advantages, it must be taken into account that new technologies favor:
  - Agility, assuming time savings for both the citizen and the Administration. Its availability is such that it can be found on the platforms 24 hours a day, 365 days a year, and without the need to travel.
  - Efficiency is another advantage provided by the use of ICTs, since the saving of time and intermediaries in access (register request manually, refer to the competent person to resolve...) as well as material resources, will favor the resolution of the social demands more quickly and with the use of fewer means.

- Availability of access anywhere and at any time, since citizens can communicate with the Administration from anywhere in the world if they have the appropriate technological resources.
- Increased citizen participation and information, since, through a small gesture, a simple visit to the website, you will have at your disposal all the necessary information to carry out any action, contributing to increasing your possibility of participation.
- Ecologically sustainable, because through ICTs, the use of paper will decrease considerably, as well as the need for the user to travel to the physical place of the Administration.
- Safe, with the protection of telematic channels supported by new technologies, through the contracting of protected computer services and adjusted to the personal data protection regulations[19,20].

- Regarding the drawbacks in the use of ICTs by citizens with the Administration, we can highlight the following:
  - Heterogeneity of technological resources by citizens, since it is verifiable that citizens do not manage or possess the same technological structural means, which can produce, in case of making digital access exclusive, marginalization, lack of protection and violation of rights for those who don't have them.
  - Inequality in the knowledge of the use of ICTs. Digital literacy for the use of ICTs is fundamental; therefore, if there are certain social groups that due to age or disability do not have it, it may be that electronic implantation represents an access barrier and, hence, a detriment in terms of opportunities and violation of their rights.
  - High cost: sometimes we can find ourselves with a shortage of human and material resources for the adequate adaptability of the necessary technological instruments, both from the Administration (some Local Entities), and from the citizen.
  - Exposure of personal data: privacy is essential to be respected in the use of electronic media, because when we talk about personal files that are used on the web and given the countless cyberattacks that occur even in high political spheres, it can produce insecurity.
  - Complexity: sometimes we can find cumbersome websites, not very intuitive in terms of their use, due to the specificity of standardized procedures.

Consequently, given the different points of view, both positive and negative, in the use of ICTs in Administration, we must conclude that the obstacles can be dealt with through the simple exercise of respect for freedom in the use or not of electronic processes since such implementation as a modernization and updating system cannot mean any reduction in the rights of the interested parties, but must be oriented, not to facilitate the work of the Administration, but to be one more channel of access due to its innumerable advantages (immediacy and efficiency), though not exclusive, since there may be citizens who do not have the new technologies or sufficient training for their use. It is inexcusable to contemplate different means of access to the Administration, respecting the right of all to choose their means of access. It is urgent that the Administration observe the time necessary for its effective implementation exclusively, since without a

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[19] Organic Law of 15/1999, of December 13, Protection of personal data (published in BOE of December 14) this Law adapted our system to the provisions of Directive 95/46/CE of the European Parliament and of the Council of October 24, 1995, regarding the protection of natural persons with regard to the processing of personal data and the free circulation of these data, repealing in turn the until then in force Organic Law 5/1992, of October 29, Regulation of the automated processing of personal data.

[20] Organic Law 3/2018, of December 5, on the Protection of Personal Data and guarantee of digital rights (published in BOE of December 6).

doubt, over the years, the generations will be equipped with the appropriate digital skills for its effective operation with the Administration, for which reason they must be patient and wait for the optimal factors of modernization by society to be met.

3.3. The Digital Divide in the Elderly

As a result of the previous points, it is not difficult to conclude that after the Covid-19 pandemic and the urgent implementation of telematic means as a means of continuing with the productive means and administrative services through Electronic Government, it has been observed that the imposition of telematic processes, especially in the elderly and disabled population, has led to devastating consequences, above all, due to the lack of digital competence and technological resources.

We understand the digital divide[21] in general, as inequality in access to the Internet and ICTs. This circumstance, according to some sources, is caused by the heterogeneity of the implementation of telematic resources derived from social imbalances at a global level. It is estimated that it affects 52% of women and 42% of men in the world[22]. This bias does not occur continuously, as it will also depend on the level of the world's regions, so according to the Word Stats portal as of May 2020, the African continent would have a much lower level of connection, around 39. 3% compared to 87.2% of Europeans and 94.6% of North Americans.

In short, what can be seen is the undoubted existence of a profound difference at the global level. These data show us the great technological difference between some countries and others so that digital literacy is still in a process of consolidation through the promotion of progress in search of a balance of the States in the different areas of society, education in terms of its technological training, economic in terms of the necessary structural resources and social in terms of promoting the integration of all sectors of the population in an equal manner.

But if we go even deeper into the digital gap and establish the comparison in the European space by reason of age, this gap also widens, with older people being the most affected in terms of their possibilities of access.

According to a study on the digital divide in aging in Spain, 73.3% of older people between 65 and 74 years of age used the Internet in 2021, increasing the percentage exponentially far from the 5.1% in 2006, according to the National Institute of Statistics (INE) in the "Survey on Equipment and Use of Information and Communication Technologies in Households". However, in the last three years, caused by the health pandemic, it has grown faster, obviously due to the needs that have arisen, leading to a considerable reduction in the digital divide of the elderly[23]. If we look carefully, we see that it is clear that they have ignored those over 74 years of age as an age range, because if this group is excluded, the percentages would not be so encourag-

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[21]   In 2001, the OECD defined the digital divide as the "divide between individuals, households, economic and geographic areas with different socioeconomic levels in relation to both their opportunities for access to ICTs and the use of the Internet for a wide variety of activities." Visible Portal, "6 key points on the digital divide and the right to the Internet", https://www.visibles.org/es/actualidad/democracia-y-participacion/6-puntos-clave-sobre-brecha-digital-y- Derecho-internet (accessed May 1, 2022).

[22]   Iberdrola Portal, https://www.iberdrola.com/compromiso-social/que-es-brecha-digital (accessed May 15, 2022).

[23]   Web aging portal, https://agingenred.es/la-brecha-digital-por-edad-los-mayores-continuan-reduciendola/ (accessed May 2, 2022).

ing. We must dwell even more on these data that are offered to us and relate them to life expectancy at birth in Spain, being 85.4 years for women, compared to 80 years for men for the year 2020, according to the INE[24], as well as a similar equivalence in the community environment, although not as high as in Spain. If we establish an average of 83 years of life expectancy at birth in Spain, a figure also approximate in the European environment, we can see that the calculations observed in relation to the digital divide reach up to 74 years, leaving 9 years on average without determining in terms of their access to digital skills, glimpsing at its obviousness that people over 75 years of age have less access to ICTs or lack them, so if they had been taken into account, it would mean a lower percentage in the survey cited in the access of the elderly in the use of technologies.

According to the INE, in relation to the use of the Internet during the last three months by age groups, it clarified the issue a little more, since as of 2019 it was detected that 90% of young people between 16 and 64 used the Internet in the last three months, 63% of people between 65 and 74 years old and finally, 23% of people over 75 years old, which implies the obvious existence of the age gap. We can still delve deeper into the gap if we compare it by gender. According to the same source, regarding the gender gap in relation to the survey of "at least some computer knowledge", we find for 2021 in age ranges under 65 that there is no such gap, but when we refer to the same does not occur among older people, since in men a percentage of 45.8% is observed, compared to 33.2% in women within the age range of 65 to 74 years[25]. What clearly determines the double gap, and, therefore, if we exceed 74 years, we can clearly verify that, at an older age, it is very likely that such a gender gap will be more pronounced.

4. COMPARATIVE LAW IN THE USE OF ICTS AND ELECTRONIC GOVERNMENT

Globalization is an indisputable phenomenon in today's world, in which ICTs have played a fundamental role in achieving it. However, not all countries are in the same process of modernization and development, as we have seen in previous points, so their global impact will be at a different level, depending on a multitude of elements, such as their economy, index of social and technological development and, evidently, political and cultural factors that favor or not the change.

In the European sphere, the Commission prepared in 2020 a document entitled the "Digital Economy and Society Index (DESI)" in which the general performance in the European environment in relation to its digital competitiveness is studied, giving quite encouraging results, especially caused by the Covid-19 pandemic, with the accelerated implementation of the use of digital technologies immediately.

Among the most digitized countries according to the DESI report are Finland, Sweden, Denmark, and the Netherlands, also adding that they are world leaders. It is followed by Malta, Ireland, and Estonia, with Ireland being the country that has had the most successful digital transformation in the last five years, followed by the Netherlands, Malta, and Spain, obtaining a performance above the European average. The study made a series of relevant observations in

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[24]   Portal of the National Institute of Statistics. Life expectancy in Spain. https://www.ine.es/ss/Satellite?c=INESeccion_C&cid=1259926380048&p=1254735110672&pagename=ProductosYServicios%2FPYSLayout (accessed May 10, 2022).

[25]   Portal National Institute of Statistics. Percentage of adults (16 to 74 years old) who in the last 12 months have carried out tasks related to computer skills by sex, age group and type of task. https://www.ine.es/jaxiT3/Tabla.htm?t=46292 (accessed May 5, 2022).

relation to the human factor and its digital skills, highlighting this circumstance as essential to be able to advance in terms of digital skills because if these are adequate, they will inexcusably favor the existence of an efficient communication system, and information of citizens with the Administration and in general, with the digital transformation of society.

In the DESI report, the digital skills of the EU population were analyzed, giving the following results: 42% of the European population lacks the minimum digital skills. In relation to the use of digital public services in the field of electronic administration and online health, 67% on average use them in the European space, the most technological countries in terms of their use with the Administration are Estonia, Spain, Denmark, Finland, and Latvia.

Finland is the first country in the world in the implementation of ICTs, both in use and in application, according to the "World Report on Information Technology" published by the World Economic Forum, in association with the development program of the World Bank (InfoDev) and the INSEAD business administration school, through an evaluation of 82 countries. The report produced an index of adequate network readiness (NRI). This index revealed that, due to the inadequate dissemination of ICTs, the US fell to the second position, unlike Finland, which climbed to the first position. According to the report, the United Kingdom would occupy the seventh position, Denmark the eighth, and very close would be Germany with the tenth position and the Netherlands with the eleventh. Countries such as France, in 19th place, Spain in 25th and Italy in 26th, were not far behind.

However, it must be taken into account that one thing is the technological level of a country and another is the implementation of ICTs in the Electronic Government since there are considerable differences between some States and others. According to a UN study on "the electronic government of the United Nations" published on August 6, 2020, Estonia is among the three most advanced countries in this regard. Out of 193 UN Member States, Estonia together with Denmark and the Republic of Korea led all countries with the most "Electronic Government Development Index"[26], with Estonia ranking first in the global e-participation index. According to this study, the citizens of this country do practically everything online, except getting married, divorcing, and buying and selling real estate. Such is its digital resilience, it also adds, that it has committed to reducing the digital divide in other countries through an online help "e-Estonia Briefing Center" providing solutions to more than 130 countries, including Japan and the US[27].

The countries that lead the ranking according to the "Electronic Participation Index" worldwide, are Estonia first, as has already been said, then the Republic of Korea, the USA, Japan, New Zealand, Austria, Singapore and the United Kingdom. This study also adds that this situation has been a direct consequence of the COVID-19 pandemic, which, due to its urgency at the time of confinement and paralyzing the country more lightly, innovative initiatives were used in all areas, from economy with digital commerce, to the Government, with the introduction of the digitization of the public sector. However, this study once again focuses on the lack of digital access for many citizens, denouncing the digital gap, in general, from what can be deduced, that it will be even more pronounced in the most vulnerable sector of the population, the elderly.

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[26] It constitutes a classification instrument in terms of digital government, which captures the scope and quality of online services, the state of the telecommunications infrastructure and the existing human capacity. https://publicadministration.un.org/en/Research/UN-e-Government-Surveys (accessed May 29, 2022).

[27] UN website. https://publicadministration.un.org/Portals/1/E-Government%20Survey%202020%20 Press%20Releases.pdf (accessed May 29, 2022).

At a global level, most countries follow digital government strategies with innovative initiatives ranging from the economy with digital commerce, to its implementation in the Government through the use of open data, striving to mitigate the obstacles to digitization on a large scale in public sector functions. However, many citizens still do not have access to online services, according to the applied survey. "Digital transformation is now a critical part of the national sustainable development of many countries. And the accelerated pace of digital transformation during COVID-19 is a positive side", the Undersecretary General for Economic and Social Affairs (Mr. Liu Zhenmin)[28] expressly highlighted, also highlighting the problems found in the study on the "Electronic Government Survey 2020": the absence of benefits, the existence of barriers due to lack of understanding of the data, limited resources, concerns with the quality, security and privacy of data, including finally the requirement of a long-term approach.

In short, despite the efforts to integrate ICTs in Electronic Government worldwide, depending on the country depending on its development, dysfunctions among citizens are detected due to a multitude of factors, especially due to the lack of both technological and technological resources, such as those derived from the digital competence of citizens.

5. CONCLUSION

To conclude, in this proposed work regarding the detection of the rights of the person of legal age in access to the procedures of the Administration through the Electronic Government, we can say that, despite the existence of innumerable instruments to promote the use of ICTs to achieve efficient communication and information for citizens, in the case of older people the existence of a marked digital divide has been detected and even more so if we delve into gender.

The new technologies introduced in the information and communication processes despite being a reality that promotes a large number of advantages for the citizens of the world, it should be noted that their exclusive use can determine the violation of the rights of citizens, especially of the elderly or disabled due to the lack of adaptation to the environment derived from the scarcity of technological, economic or even social resources.

After the detection of the obstacles that are determined in this study as a consequence of the study of the legal and technological situation that we live in, as a result of its evolution and promotion for years, it is observed that the global society is not yet prepared for digital communication as the only system of information, communication, and access to the Administration. Therefore, it is inexcusable to keep intact the right to freedom, as an inherent right of the inalienable person, to respect the decision to choose the way to exercise their right of access. That the Electronic Government be one more opportunity to improve the service of the citizen and not the other way around, because the Administration finds it more comfortable, economical and agile, but as one more possibility for those who consider it so, whether they are older citizens or not, thus respecting the integral freedom of the individual in the full achievement of their integration in all areas of community life.

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[28] UN website. Welcome Remarks and Substantive Key Messages Launch of the 2020 United Nations E-Government Survey https://www.un.org/development/desa/statements/mr-liu/2020/07/remarks-launch-2020-egov-survey.html (accessed May 29, 2022).

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Changes in the Electricity Market in the Republic of North Macedonia and Its Compliance with European Regulations, Characteristics and Official Data on the Macedonian Regulated Market for the Period 2019-2021

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Abstract: *First and foremost, the main inspiration for the specific problem in this paper are the changes in the electricity market of the Republic of North Macedonia (in the text as - "RSM") and its compliance with European regulations, elaborating the characteristics and official data on the Macedonian regulated market. By summarizing all the theoretical and empirical aspects, the answers to the arising questions are provided through the analysis of the legal framework, the condition and the participants in the electricity-regulated market in the country in the analyzed period of three years (2019-2021). Also, the results and conclusions of the research shall be achieved via comprehensive analysis and by finding the answers to the posed questions through the theoretical analysis, the inductive and deductive methods, whereas the techniques utilized shall be: official data and reports of the Regulatory Commission of energetic and water services of RSM, questionnaires, interviews and observations as well. The main conclusion is that the changes in the regulated market are under the influence of the changed Macedonian regulations, the process of harmonization with the European regulations and the current developments related to the energy market globally. In this paper, the goal is achieved through the elaboration of changes in the legislation in the Republic of North Macedonia and its implementation in the past few years, emphasizing the effects on the liberalization of the electricity market.*

1. INTRODUCTION

The global crisis caused by the pandemic of Covid-19, due to reduced oil production, was transferred to the energy sector, which energy crisis in Europe, did not pass the energy sector in the Republic of North Macedonia. All of this affected the change in electricity prices, both in the regulated market and in the unregulated electricity market. Specifically, it led to an increase in electricity prices on the electricity market, through the price of electricity imports, the cost of electricity production, and the price to consumers as end users.

The adoption of the last Energy Law was a result of the harmonization with European directives and regulations. The electricity sector in the Republic of North Macedonia in 2019 has undergone significant changes, primarily due to the fact that starting from January 1, 2019, all electricity consumers, including households, have gained the right to choose their own electricity supplier and to mutually agree on the conditions and prices on the basis of which the electricity supply will be performed.

The full liberalization of the electricity market in 2019 contributed to the increase in the number of active electricity suppliers/traders and the increased number of procedures for changing the

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electricity supplier. This means that competition in the retail electricity market is increasing and consumers are getting better offers from suppliers/traders. In the retail market, the full liberalization started on January 1, 2019, when each consumer gained the right to independently choose their own electricity supplier and to agree on the terms of supply and the price of electricity.

2. ELECTRICITY MARKET AND CHANGES IN THE ELECTRICITY MARKET

The electricity market is an organized way of buying and selling electricity based on supply and demand, applying conditions prescribed by the Law on Energy. The electricity market consists of two segments, regulated and unregulated electricity market. In the regulated electricity market, the purchase and sale of electricity and power are performed at prices and conditions approved by the Energy Regulatory Commission. In the unregulated electricity market, the purchase and sale of electricity and power are done at prices and conditions that are freely agreed upon between the buyer and the seller, at their own choice, risk and cost.

The electricity sector in 2019 is undergoing significant changes, primarily due to the fact that starting from January 1, 2019, all electricity consumers, including households, have gained the right to choose their own electricity supplier and mutually agree on the conditions and prices on the basis of which the electricity supply will be performed. The full liberalization of the electricity market in 2019 contributed to an increase in the number of active suppliers/traders of electricity for four new entities compared to 2018. This was followed by an increased number of procedures to change the electricity supplier, which in 2019 increased by 66.46% compared to 2018.

This means that competition in the retail electricity market is increasing and consumers are getting better offers from suppliers/traders. During 2019, not all consumers decided to choose their own electricity supplier and some until June 30, 2019, were supplied through the electricity supplier to tariff consumers, EVN Macedonia AD Skopje, while from July 1, 2019, they continued to be supplied under the same conditions through the universal electricity supplier EVN HOME DOO Skopje.

The introduction of the Universal Electricity Supplier proved to be a successful model that provided the best price for small consumers and households, and at the same time, the liberalization of the electricity market brought lower costs for certain consumers by up to 30%. Households have seen a 5% reduction in electricity bills as a result of the applied cheap daily tariff. Energy Regulatory Commission determined that AD MEPSO Skopje met the requirements of Directive 2009/72 / EC of the European Parliament and of the Council of 13 July 2009 on general rules of the internal market and Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on the conditions for access to cross-border electricity exchange networks and designated it as the electricity transmission system operator of the Republic of North Macedonia (Annual report, 2019). The electricity market during 2020 recorded significant positive trends despite the Covid-19 pandemic. Also, the number of active electricity suppliers has increased, in 2020 were 16 active suppliers, which is 4 more than in 2019. This means that the competition in the retail electricity market is increasing and consumers are getting better offers from suppliers/traders. In 2020, for the first time, the consumption of electricity on the open market was higher than the consumption of electricity on the regulated market and amounted to 52.24 % of the total gross electricity consumption.

MEMO DOOEL Skopje, as an operator on the organized electricity market, is also a nominated operator on the electricity market, which has the task of merging the electricity market in North Macedonia with the electricity markets in the region, i.e. primarily with Bulgaria (Annual report, 2020).

The second half of 2021 was marked by significant disruptions in the functioning of the electricity market due to the high rise in prices, which resulted in the declaration of a crisis in electricity supply by the Government of the Republic of North Macedonia on November 9, 2021, which was extended by the Assembly of the Republic of North Macedonia until June 9, 2022. In the period from July 2021, the prices of electricity on the regional stock exchanges started to increase and this was reflected in the purchase prices of the electricity suppliers in the country. They faced the termination of contracts with suppliers in the region, i.e. a significant increase in energy prices, which resulted in the termination of contracts. In parallel with this situation, there was a decrease in electricity production of the largest producer of electricity AD ESM. The lack of electricity was provided by the import and commissioning of TPP Negotino. In the first months of 2022, there is still a crisis in the electricity supply. These negative trends were also reflected in the regulated supplier EVN HOME DOO Skopje, which in 2021, part of the energy that could not be procured from the largest producer of electricity AD ESM, was procured from traders on the free market.

These purchases in 2021 are 68 times higher than the same in 2020, while the price of electricity purchased on the free market in 2021 increased by 24% compared to the previous 2020. Thus, in 2021 EVN HOME DOO Skopje procured electricity on the open market in the amount of 391,166 MWh, which is 385,408 MWh more than in 2020 when the procurement amounted to 5,758 MWh.

The average purchase price of the quantities in 2021 was 5,023.4 denars / MWh (81, 68 euros / MWh), while the purchase price in 2020 was 4,046.3 denars / MWh (65.79 euros / MWh).

For these procurements, EVN HOME DOO Skopje in 2021 paid 1,964,983,284 denars, or almost 32 million euros, while in 2020 23,298,595 denars, or about 380 thousand euros. These conditions also had an impact on the increase in the average purchase price of electricity. Electricity sales by the regulated supplier in 2021 increased by 3.5% compared to 2020, while the average selling price in 2021 was higher by 10.1% compared to the previous 2020 (Annual report, 2021).

3.   REGULATED MARKET IN 2019

The reform of the electricity market, the preparation of which began in 2018, and was implemented in 2019 through its full liberalization, i.e. enabling all consumers to gain the right to free choice of supplier, also contained a component for consumer protection through the introduction of universal power supply service.

EVN HOME DOO Skopje, as a universal supplier and supplier of last resort electricity, started operating on July 1, 2019, which provided protection for small consumers and households in cases where they did not choose a supplier on the free market or due to certain circumstances were left without an electricity supplier so that they could be supplied by the universal supplier EVN HOME DOO Skopje at prices and tariffs approved by the Energy Regulatory Commission.

Thereby, the prices at which electricity is sold in this case are not regulated by the Energy Regulatory Commission, i.e. these prices are determined each month based on the realized monthly market prices one day in advance on the Hungarian Electricity Exchange (HUPX), increased by 50%.

Table 1. Quantities and average prices of electricity purchased
from the regulated supplier in 2019 (in kWh and day / kWh)

Total/average	Quantity (kWh)	Price (MKD/kWh)
	3,806,597,464	**2.5350**
AD ESM Skopje	3,596,962,486	2.2947
Electricity distribution	2,747,370	3.4837
Preferential RES manufacturers	208,903,153	6,6373
AD MEPSO Skopje	-2,015,545	

Source: Annual report on the work of the Energy and Water Services Regulatory Commission of the Republic of North Macedonia in 2019 https://www.erc.org.mk/odluki/3RKE%20GI_2019-final.pdf

EVN Makedonija AD Skopje in the first half of 2019, and EVN HOME DOO Skopje in the second half of the year, most of the electricity needed for the supply of households and small consumers was provided by AD ESM Skopje. The rest of the electricity for the needs of the regulated supply in 2019 was provided by the preferential producers of electricity from renewable sources, and a small part was purchased from the surplus of purchased electricity to cover the losses of electricity from Elektrodistribucija (Electricity distribution).

From the analyses the largest share of electricity sales in 2019 has the category Households (79.81%), of which 77.97% is for households with double tariff meters, while 1.84% is the share of household sales with a single tariff meter.

The remaining categories of consumers participate with a total of 20.19% in the sales of the regulated supplier, and most of that belongs to the remaining consumers of the second tariff level, i.e. small consumers with 9.88%.

4.   REGULATED MARKET IN 2020

The prices at which electricity is sold in this case are not regulated by the Energy Regulatory Commission, i.e. these prices are determined each month based on the realized monthly market prices one day in advance on the Hungarian Electricity Exchange (HUPX), magnified by 50%. Table 2 shows the quantities and average prices of electricity purchased from the regulated supplier in 2020.

Table 2. Quantities and average prices of electricity purchased from the regulated supplier
in 2020 (in kWh and MKD/kWh)

Total / Average	Quantity (kWh)	Price (MKD/kWh)
	3.562.408.006006	**2, 5253**
AD ESM Skopje	3.330.612.000	2.2514
ALPIK Skopje	5,758.000	4, 0463
Preferential RES manufacturers	201.907.769	7.0133
GENI-I Sale	- 392.000	- 148, 9214
AD MEPSO Skopje	24.522.237	

Source: Annual report on the work of the Energy and Water Services Regulatory Commission of the Republic of North Macedonia in 2020, https://www.erc.org.mk/odluki/2021.04.28_RKE%20 GI%202020-final.pdf

Most of the electricity needed for the supply of households and small consumers was provided by AD ESM Skopje. The rest of the electricity for the needs of small consumers and households was provided by the preferential producers of electricity from renewable sources, and a small part was the withdrawal of electricity from the system due to imbalances, as well as the purchase of electricity from traders and sale of others traders in order to optimize the portfolio. Table 3 shows the quantity and average prices of electricity purchased from the regulated supplier in the period from 2018 until 2020.

Table 3. Quantity and average prices of electricity purchased from the regulated supplier in the period from 2018 until 2020 (in MWh and day / MWh)

Year	2018		2019		2020	
Total / average	**MWh**	**MKD/MWh**	**MWh**	**MKD/MWh**	**MWh**	**MKD/MWh**
	3,871,270	**2,764.7**	**3,806,597**	**2,535.0**	**3,562,408**	**2,525.3**
AD ESM	3,484,704	2,483.0	3,596,962	2,294.7	3,330,612	2,251.0
Electricity distribution	28,517	3,426.3	2,747	3,483.7	0	0
Preferential RES manufacturers	241.73	6,158.7	208,903	6,637.3	201,908	7,013.3
Procurement on the free market	116.32	3,988.0			5,758	4.0463
AD MEPSO			-2.016		24,522	

Source: Annual report on the work of the Energy and Water Services Regulatory Commission of the Republic of North Macedonia in 2020, https://www.erc.org.mk/odluki/2021.04.28_RKE%20 GI%202020-final.pdf

From the data shown in Table 3, it can be seen that in 2020, compared to the previous 2019, electricity was procured on the free market. During 2018 there were also certain quantities that were procured on the free market. During 2020 It can be noticed that EVN HOME Skopje no longer takes over the excess electricity from Elektrodistribucija (Electricity distribution), and as one of the reasons is that both participants in the electricity market are balance responsible.

From analyses can be noticed that there is a continuous decrease in the total quantities of electricity procured by the universal supplier, which is in correlation with the increased volume of procurement on the free electricity market. At the same time, the average price for electricity supply in 2020 is 6.80% lower than the average price in 2019, or is 8.77% lower compared to 2018.

The regulated supplier during 2020 has realized sales of 3,562,407,991 kWh, at an average price of MKD 4,429 / kWh including network service charges. The largest share of electricity sales in 2020 is in the Household category (89.58%), of which 87.83% is the share of sales for households with two-tariff meters, while 1.74% is the share of households with one-tariff meters.

From analyses it can be concluded that there are changes over the years, i.e. electricity consumption among all categories of consumers supplied by the universal supplier, except for households, is decreasing. The most pronounced is the change in public lighting where in 2020, there is a decrease of about 97% compared to 2019 and in relation to 2018, because the municipalities, which are in charge of public lighting, procure electricity needs on the free electricity market. For consumers connected to medium voltage, electricity consumption in 2020 is about 70% lower compared to electricity consumption in 2019 and 2018, respectively. In the case of low voltage consumers, which fall into the category of other consumers, the consumption of electricity in 2020 is reduced by 40% compared to 2019, i.e. by 49% compared to 2018. All this shows that consumers are taking advantage of the free electricity market and are slowly leaving the regulated part of the electricity market. In line with trends, households are expected to remain supplied by the universal supplier in the medium term.

Table 4 provides an overview of average selling prices, including network service charges, of the Tariff Consumer Supplier in 2018, the Tariff Consumer Supplier and the Universal Supplier in 2019, i.e. the Universal Supplier in 2020.

Table 4. Average selling prices of a supplier to tariff consumers/universal supplier in 2018, 2019 and 2020 (in MKD / kWh and%)

Year	2018	2019	2020	2020/19	2020/18
Average	(MKD/kWh)	(MKD/kWh)	(MKD/kWh)	(%)	(%)
	4,5193	**4.4473**	**4.4929**	**1.03**	**-0.58**
Consumers - 35 kV	5.1182	4.0688	5.1346	26,19	0.32
Consumers - 10 (20) kV	6,0488	4.9999	4.9160	-1.68	-18.73
Other I degree	6.9251	6,2013	6,5186	5.12	-5.87
Other II degree	8.6760	8.6640	8.8905	2.61	2.47
Public lighting	5,5600	5,5600	5.6596	1.79	1.79
Households 1T	4.4454	4.4400	4,5593	2.69	2.56
Households 2T	4.0715	4.0611	4,1984	3.38	3.12

Source: Annual report on the work of the Energy and Water Services Regulatory Commission of the Republic of North Macedonia in 2020, https://www.erc.org.mk/odluki/2021.04.28_RKE%20 GI%202020-final.pdf

The key conclusion from the last table is that the average selling price for supplying consumers in the regulated market in 2020 has increased by 1.03% compared to 2019, while it is lower compared to 2018. by 0.58% (Table 4).

When it comes to electricity prices of consumers in the regulated electricity market, during 2020 there is a clear tendency for electricity prices, especially for households, to go up and therefore it is necessary to increase the coverage of different categories of households that would fall into the category of vulnerable consumers.

5. REGULATED MARKET IN 2021

EVN HOME DOO Skopje, as a universal supplier and supplier of last resort with electricity, during 2021 supplied households and small consumers who did not choose a supplier on the free market or due to certain circumstances were left without an electricity supplier. EVN HOME DOO Skopje supplied consumers with prices and tariffs approved by the Energy Regulatory Commission. Other consumers who do not have the right to use the universal service, in cases when for certain reasons they are left without a supply on the free market, have the right for a period of up to 90 days until concluding a new contract with a supplier on the free market to use the electricity supply electricity service in the last case, which is also provided by EVN HOME DOO Skopje. The prices at which electricity is sold in this case are not regulated by the Energy Regulatory Commission. These prices are determined every month based on the realized monthly market prices one day in advance on the Hungarian Electricity Exchange (HUPX), which increased by 50 %. Table 5 shows the quantities and average prices of electricity purchased from the regulated supplier in 2021.

EVN HOME DOO Skopje in 2021 provided most of the electricity needed for the supply of households and small consumers from AD ESM Skopje. Table 6 shows the quantity and average prices of electricity purchased from the regulated supplier from 2019 to 2020.

Table 5. Quantities and average prices of electricity from the universal supplier in 2021 (in kWh and MKD/kWh)

Total / average	Quantity (kWh)	Price (MKD/kWh)
	3,687,508,661	**2.8615**
AD MEPSO Skopje	-24,481,699	5,2474
AD ESM Skopje	3,103,998,000	2.3527
ALPIK Skopje	70,083,000	3.8675
DANSKE Skopje	7,440,000	4.0613
Energy Wind	7,072,000	3.5377
Geni - I Energy MK	287,091,000	5.4655
HSE Mak Energy	15,760,000	3.4860
Preferential manufacturers	3,720,000	6,5140
Grin Energy	216,826,360	3.9411

Source: Annual report on the operation of the Energy and Water Services Regulatory Commission of the Republic of North Macedonia in 2021, https://www.erc.org.mk/odluki/22022.04.29_RKE%20GI%202021-FINAL.pdf

Table 6. Quantity and average prices of electricity purchased from the regulated supplier in the period from 2019 to 2021 (in MWh and day / MWh)

Year	2019		2020		2021	
	MWh	**MKD/MWh**	**MWh**	**MKD/MWh**	**MWh**	**MKD/MWh**
Total / average	**3,806,597**	**2,535.0**	**3,562,408**	**2,525.3**	**3,687,509**	**2,861.5**
AD ESM	3,596,962	2,294.7	3,330,612	2,251.0	3,103,998	2,352.7
Electricity distribution	2,747	3,483.7	0	0	0	0
Preferential RES manufacturers	208,903	6,637.3	201,908	7,013.3	216,826	6,514.0
Procurement on the free market			5,758	4.0463	391,166	5,023.4
AD MEPSO	-2.016		24,522		-24,482	5,247.4

Source: Annual report on the operation of the Energy and Water Services Regulatory Commission of the Republic of North Macedonia in 2021, https://www.erc.org.mk/odluki/22022.04.29_RKE%20GI%202021-FINAL.pdf

From the analyzed data it can be seen that in 2021, compared to the previous 2020, the supply of electricity on the free market has increased by 68 times. The price of the purchased electricity on the free market in 2021 has increased by 24%. This also has an impact on the total cost of electricity purchased from the universal supplier. In 2021 EVN HOME DOO Skopje has left part of the procured electricity in the system, i.e. it has realized positive imbalances for which it has realized income from AD MEPSO Skopje.

In the past three years, EVN HOME DOO Skopje has paid a total of 23,053,931,408 denars (374.9 million euros) for AD ESM Skopje or 8,253,948,701 denars (134.2 million euros) in 2019, 7,497,207,612 denars (121.9 million euros) in 2020 and 7,302,776,095 denars (118.7 million euros) in 2021.

EVN HOME DOO Skopje has paid a total of 4,214,997,822 denars (68.5 million euros) for electricity from the preferential producers of electricity, namely 1,386,551,882 denars (22.5 million euros) in 2019, then 1,416,041,376 denars (23 million euros) in 2020 and 1,412,404,564 denars (23 million euros) in 2021.

Finally, EVN HOME DOO Skopje in the last three years on the liberalized electricity market has procured electricity in a total value of 1,988,281,879 denars (32.3 million euros), of which 23,298,595 denars (378,839 euros) in 2020 and 1,964,983,284 denars (31.9 million euros) in 2021, while in 2019 there were no procurements on the liberalized electricity market.

The regulated supplier during 2021 has realized sales of 3,688,348,758 kWh, at an average price of MKD 4,9453 / kWh, including fees for network services, fee for organizing and managing the electricity market, energy and compensation for preferential producers, so it has generated a total revenue of about 296 million euros.

The largest share of electricity sales in 2021 has the category Households (90%), of which 88.49% is the share of sales for households with two-tariff meters, while 1.44% is the share of households with single-tariff meters.

The remaining categories of consumers participate with a total of 10% in the sales of the universal supplier, and most of them have the remaining consumers of the second tariff level with 6.73%.

From the above data it can be noticed changes over the years, i.e. that the consumption of electricity increases in most categories of consumers supplied by the universal supplier. Thereby, the change in the public lighting is most pronounced, where in 2021 there is a decrease of about 63% and compared to 2020 and 99% compared to 2019 and 2018, because the municipalities, which are in charge of public lighting, procure electricity needs on the free electricity market.

Furthermore, for consumers connected to medium voltage, electricity consumption in 2021 is about 1.2% higher compared to electricity consumption in 2020, i.e. 69% lower than in 2019. For low voltage consumers, which fall into the category of other consumers, electricity consumption in 2021 has increased by 0.4% compared to 2020, i.e. decreased by 40% compared to 2019. In line with the trends, however, households are expected to remain supplied by the universal supplier in the medium term.

The indicator that the electricity consumption of this category of consumers has increased by 0.4 %, does not mean a trend in terms of returning consumers to the regulated part of the electricity market, but simply a certain increase in consumer consumption in the regulated market. The key conclusion is that the average selling price for supply of consumers on the regulated market in 2021 has increased by 10.42% compared to 2020, i.e. by 11.20% compared to 2019. The Energy Regulatory Commission, when it comes to electricity prices of consumers in the regulated electricity market, during 2020 and 2021, has repeatedly stated that there is a clear tendency for electricity prices, especially for households, to go up. What can be noticed in the last quarter of 2021 is that a significant number of small consumers, due to the increase in electricity prices on the free market, returned to the regulated market where electricity prices were already lower than market prices. The following Table 7 shows the realized sale of electricity to small consumers by the universal supplier in the last quarter of 2020 and 2021.

From the table 7. it can be seen that in the last quarter of 2021, compared to the last quarter of 2020, total electricity sales to small consumers by the universal supplier increased by 38.04%.

Table 7. Sale of electricity to small consumers by the universal supplier in the last quarter of 2020 and 2021 (in MWh and%)

	Q4-2020 (MWh)	Q4-2021 (MWh)	Q4-2021 / Q4-2020 (in %)
Consumers - 35 kV	462	1,103	138.59
Consumers - 10 (20) kV	10,475	18,924	80.66
Other I degree	17,322	28,677	65.56
Other II degree	54,706	66,303	21.20
Public lighting	527	246	-53.25
Total	**83,492**	**115,253**	**38.04**

Source: Annual report on the operation of the Energy and Water Services Regulatory Commission of the Republic of North Macedonia in 2021, https://www.erc.org.mk/odluki/22022.04.29_RKE%20 GI%202021-FINAL.pdf

6.   CONCLUSION

The Regulatory Commission for Energy and Water Services of the RNM, within its competencies, made a significant contribution to achieving the set goals in the energy sector, through the implementation of an appropriate regulatory framework, created on the basis of the obligations arising from the Third Energy Package for the Internal Market Energy of the European Union, and are accepted by the Energy Community.

The electricity sector in 2019 is undergoing significant changes, primarily due to the fact that starting from January 1, 2019, all electricity consumers, including households, have gained the right to choose their own electricity supplier and mutually agree on terms and prices under which the electricity supply will be performed. Starting from July 1, 2019, the price for production of electricity of the largest producer of electricity, AD ESM (Elektrani na Severna Makedonija) is no longer determined by the Energy Regulatory Commission, which enabled the full opening of the wholesale electricity market.

EVN HOME DOO Skopje supplied consumers at prices and tariffs approved by the Energy Regulatory Commission, and in 2021 most of the electricity needed to supply households and small consumers was provided by AD ESM Skopje. From the analyzed official data, it can be seen that in 2021, compared to the previous 2020, the supply of electricity on the free market has increased 68 times. The price of the purchased electricity on the free market in 2021 has increased by 24%. This also has an impact on the total cost of electricity purchased from the universal supplier.

From the above data, it can be noticed changes over the years, i.e. that the consumption of electricity increases in most categories of consumers supplied by the universal supplier. Thereby, the change in the public lighting is most pronounced, where in 2021 there is a decrease of about 63% compared to 2020 and 99% compared to 2019 and 2018, because the municipalities, which are in charge of public lighting, procure electricity needs on the free electricity market.

The key conclusion is that the average selling price for supply of consumers on the regulated market in 2021 has increased by 10.42% compared to 2020, i.e. by 11.20% compared to 2019. When it comes to electricity prices of consumers in the regulated electricity market, during 2020 and 2021 is a clear tendency for electricity prices, especially for households, to go up. What can be noticed in the last quarter of 2021 is that a significant number of small consumers, due to the increase of electricity prices on the free market, returned to the regulated market

where electricity prices were already lower than the market due to which in the last quarter of 2021, compared to the last quarter of 2020, total electricity sales to small consumers by the universal supplier increased by 38.04%.

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Classification of Environmental Administrative Acts in the Czech Legislation

Dominik Židek[1]

Abstract: *This paper aims to provide an essential characterisation and classification of environmental administrative acts regulated by law in the Czech Republic, which are related to public construction law, affect the procedural procedures of public construction law, and thus fundamentally determine the final form of construction activities in the Czech Republic. The paper is based on the premise that the results of the procedural procedures of public construction law are always influenced, at least indirectly, by environmental law regulations and administrative acts regulated by these regulations. In the paper, the author will make a primary classification of environmental administrative acts, will deal with the different types of environmental administrative acts, emphasise their importance for the preservation of sustainable development in the development of the territory, and will demonstrate the importance of this environmental legal regulation in the Czech Republic on specific examples.*

1. INTRODUCTION

In author's previous research, from which this article is extensively based, it was concluded that *"the results of public construction law proceedings in the Czech Republic are always influenced, at least even indirectly, by environmental law regulations and the administrative acts regulated by those regulations"* (Židek, 2019, p. 174). In this article, we will therefore make a primary classification of environmental administrative acts affecting (not only) construction activities as they are regulated in the Czech legal system. We will also demonstrate the importance of this environmental legal regulation in the Czech Republic with concrete examples.

Therefore, this article's primary focus is to analyse the legal nature of individual 'environmental' administrative acts and to make a primary systematic classification of them. According to the legal theory (Průcha, 2012, p. 271) and also according to the established legal practice, we divide 'environmental' administrative acts into normative administrative acts, individual administrative acts, administrative acts of mixed nature, public law contracts, factual acts with direct legal consequences and non-legal and organisational forms of public administration. These acts will be dealt with in the individual chapters of this article.

In conclusion, we will also assess whether the legal regulation set up in this way is sustainable in the conditions of the Czech Republic, especially regarding the systematisation of legal regulation, or whether it would require some de *lege ferenda* change.

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2.   NORMATIVE ADMINISTRATIVE ACTS

Normative administrative acts are legal forms of public administration activity with a normative focus (Hendrych et al., 2009, p. 192), through which the content of laws outside the public administration is implemented. These normative administrative acts generally contain binding rules of conduct which apply to an unspecified range of addressees and are intended for repeated use (Průcha, 2012, p. 272). In the case of the 'environmental' ones, these are normative administrative acts which regulate legal relations in environmental protection.

The most typical normative administrative acts are, of course, **laws**. In the case of environmental legislation in the Czech legal order, it must be stated that it is not codified in the Czech Republic. Thus, in the case of environmental legislation, there is an entire range of cross-cutting and component legislation, which regulates consultative, permitting, prohibiting (restricting) and exceptional acts of environmental law. Examples: the Mining Act, the Nature and Landscape Protection Act, the Agricultural Land Fund Protection Act, the Forest Act, the Water Act, the Environmental Impact Assessment Act, etc. Regarding building siting and permitting, the fundamental law is Act No. 183/2006 Coll., on spatial planning and building regulations (Building Act). The essential procedural regulation of administrative law, Act No. 500/2004 Coll., the Administrative Code, and, in terms of judicial review, Act No. 150/2002 Coll., the Administrative Court Rules, cannot be ignored.

With the exception of laws, other 'environmental' normative administrative acts are **government regulations** (for example, Government Regulation No. 401/2015 Coll. on indicators and values of permissible pollution of surface water and wastewater, the details of permits for the discharge of wastewater into surface water and sewers and on sensitive areas); **generally binding legal regulations of ministries and other central state administration bodies** (here it is a whole range of implementing legal regulations to cross-cutting and component regulations of environmental law); **generally binding decrees of regions and generally binding decrees of municipalities** (in practice, these are typically e.g. municipal ordinances regulating the system of municipal waste treatment); **regulations of regions and municipal ordinances** [in the legislation, also with regard to the issue of sustainable development of the territory, the regulation of natural parks is interesting in the sense of Section 12(3) of the Act on Nature and Landscape Protection, according to which: *"In order to protect a landscape with significant concentrated aesthetic and natural values, which is not specially protected under Part Three of this Act, the nature protection authority may establish a nature park by a generally binding legal regulation and impose restrictions on such use of the area as would destroy, damage or disturb the condition of the area."* This generally binding legal regulation is then a county ordinance (Průchová, Židek, 2017, pp. 85-115).] A particular case of normative acts are **internal acts,** or so-called **internal regulations,** directed towards hierarchically subordinate entities within the public administration. They are usually referred to in practice as internal instructions (according to the historic ruling of the full Constitutional Court of the Czech Republic of 5 April 1994, Case No. Pl. ÚS 49/93 The "*defining feature of internal instructions is that they only specify the tasks and duties of subordinate units and employees. By issuing internal instructions, the authority to direct the activities of subordinates is exercised - even if it is done to specify the tasks laid down by generally binding legal provisions - and the corresponding obligation to comply with the orders issued, an obligation which, like the authority, derives from the legal norm establishing such a relationship of superiority and subordination. Generally binding decrees, on the other hand, may contain legal norms binding only a certain number of persons, but this binding*

character has nothing to do with the subordination of the authority which issued the regulation."), **instructions, directives**, etc. In practice, this will include, for example, a range of instructions on the interpretation and application of specific provisions of the legislation.

3. INDIVIDUAL ADMINISTRATIVE ACTS

We will focus on analysing 'environmental' individual administrative acts. These represent a form of activity of public administration bodies that is essentially the result of 'decision-making' on specific rights, legally protected interests or obligations of a particular subject. These acts represent the application of general rules of conduct contained in legal norms to specific cases and serve for 'one-off' uses or solutions to life situations (Průcha, 2012, p. 278). The most typical individual administrative act is an **administrative decision** under Article 67 of the Administrative Code (according to which *"By a decision, an administrative authority establishes, modifies or cancels the rights or obligations of a named person in a particular matter, or declares that such person has or does not have rights or obligations in a particular matter, or decides on procedural issues in cases provided for by law."*). Alternatively, a **resolution** under Article 76 of the Administrative Code (which, in principle, decides in administrative proceedings on non-meritorious matters, i.e., matters of a procedural nature). Other examples of individual administrative acts are **opinions, binding opinions** (according to Section 149 of the Administrative Code) and other acts under Part Four of the Administrative Code (various **statements, certificates, communications,** etc.). For this article, the above-mentioned administrative acts can be divided into those which may impose obligations or confer rights in themselves (typically decisions) and those which are the underlying act for the 'final' act and do not themselves create directly enforceable rights and obligations (typically opinions and binding opinions). However, individual administrative decisions can, of course, be interrelated in terms of content and time (the most typical case is that, in principle, a building permit cannot be issued without a final planning decision).

In the case of **environmental decisions,** although they are regulated in individual legal regulations, from a procedural point of view, the general legal regulation of administrative proceedings under the Administrative Code applies to them, with certain possible specifics. In particular, we would like to stress that for an environmental decision to be lawful, it must fulfil both formal and substantive requirements (we refer in detail to Articles 68 and 69 of the Administrative Code). Of course, other provisions of the Administrative Code also apply to 'environmental' decisions concerning the procedural procedure for their issuance, the handling of ordinary and extraordinary appeals, etc. Typical examples of environmental decisions include permits for felling trees growing outside land designated for forest functions, exemptions from the prohibition of interference with the habitats of specially protected species of plants and animals and exemptions for activities in specially protected areas, permits for water management, permits for the operation of a stationary source of air pollution, permits for the operation of a waste facility, permits for activities related to the use of nuclear energy or integrated permits under the IPPC Act.

The legal theory then knows the dual legal nature of these acts in cases where various acts are issued as a basis for other administrative acts. First, it is a **chain of administrative acts**, where each act acts outwardly independently, and issuing one act is a prerequisite for issuing a subsequent act. Each act is then the subject of a separate administrative procedure with an immediate external effect (Kocourek, Poláčková, 2010, p. 89). The above-mentioned environmental decisions are a typical example of chained administrative acts. The second possibility is the **subsumption of administrative acts**, which occurs when issuing the 'final' administrative decision is conditional on

issuing the underlying administrative acts with an emphasis on their content. The critical point is that these subsumed administrative acts do not act independently vis-à-vis the parties to the proceedings, but only through the 'final' administrative act, with the legal force of which these administrative acts also become final; they, therefore, follow the fate of the 'final' administrative act. Therefore, these subsumed administrative acts cannot be regarded as administrative decisions since they do not legally bind the individually designated subjects. Still, only the public administration body conducts the proceedings on the 'final' act, which generally has the nature of an administrative decision (Kocourek, Poláčková, 2010, p. 88). Typical examples of such subsumed administrative acts are environmental opinions and environmental binding opinions.

A simple linguistic interpretation already gives the difference between an **opinion** and a **binding opinion**, i.e. that the administrative authority deciding on the 'final' act (in the case of public building law, typically the building authority) can never deviate from a binding opinion issued according to Section 149 of the Administrative Code; in the case of an opinion, the 'final' decision may be different in justified cases, but in some instances, its content may also be binding. As the case law has established (cf. the judgment of the Supreme Administrative Court of 7 January 2009, Case No. 2 Ao 2/2008-62), the criterion here is whether they are issued to issue a decision in an administrative procedure (these opinions are referred to as 'binding opinions' and are subject to the regime of Section 149 of the Administrative Code) or for procedures which are not administrative - these are then referred to only as 'opinions'. In general, it can also be inferred from the case law cited, and we will repeat that 'binding opinions' are always binding for the operative part of the decision on which they are issued, whereas 'opinions' are not always binding. However, it follows from the previous that even ordinary 'opinions' are sometimes binding. The legislator expressly provides that 'opinions' are 'binding documents' both for the spatial development policy and for measures of a general nature issued under the Building Act. At present, these are the opinions of the authorities concerned on the development plan, the spatial development principles, the zoning plan, the regulatory plan, the definition of the built-up area, the zoning measure on building closure and the zoning measure on the redevelopment of the area. It is therefore undoubted (Průcha, Gregorová, et al., 2017, p. 57) that, although the opinions of the authorities concerned in these cases are not designated as binding by the Building Act, they are *de facto* binding in the matter in question. We would stress, however, that they are binding only as regards their content since, although they are binding documents, they do not become 'binding opinions' under Section 149 of the Administrative Code (Roztočil et al., 2016, p. 41). This *de facto* binding nature of the opinions in question determines their considerable importance in protecting environmental interests. It is, therefore, confirmed that both 'environmental opinions' and 'environmental binding opinions' are by their very nature one of the most influential environmental protection instruments in the Czech legal order.

The theoretical basis of **binding opinions** is then followed by Section 149(1) of the Administrative Code, which legally defines a binding opinion as a type of subsumed administrative act that is not a decision in an administrative proceeding and which, from a procedural point of view is an act performed under Part Four of the Administrative Code, i.e. a particular type of statement of administrative authority on a specific issue (Vedral, 2012, p. 1138). This conclusion is also supported by settled case law (cf. judgment of the Supreme Administrative Court of 23 August 2011, Case No. 2 As 75/2009-113), which states that *"binding opinions are not decisions under Section 67 of the Administrative Code, as they do not in themselves establish, modify, abrogate or bind rights and obligations."* However, this does not mean there is no need to emphasise their proper reasoning because their content is binding on the operative part of the 'final' decision. In the case

of negative binding opinions, the Supreme Administrative Court even speaks of the appropriate application of the provisions on the content, form and formalities of an administrative decision, in particular Article 68(3) of the Administrative Code, which sets out the formalities of the reasons for the decision (cf. judgment of the Supreme Administrative Court of 22 October 2009, Case No. 9 As 21/2009-150). Thus, although binding opinions are different from administrative decisions under Article 67 of the Administrative Code, given the above and, above all, because of the mutual formal and material conditionality, it cannot be but stated that: *"although binding opinion conditions the issuance of a final (final) act, the two acts are in essence complementary"* (Poláčková, 2013, p. 17). Similar conclusions regarding the reciprocal legal nature of the administrative acts in question can be drawn, taking into account the specificities in the case of environmental opinions.

Regarding the legal nature of other acts under Part Four of the Administrative Code, we note that the general regulation of these acts is defined in Sections 154 to 158 of the Administrative Code, whereby these acts are referred to as **statements, certificates and communications**. However, this group of acts is not uniform, either in terms of terminology or in terms of legal effects. Their unifying and essential element is that they do not fulfil the substantive criteria of administrative decisions or binding opinions. As it follows from the diction and systematics of the Administrative Code (e.g. according to Section 158(1) of the Administrative Code: *"The provisions of this Part shall apply mutatis mutandis when an administrative authority carries out other acts which are not regulated in Part One, Three, Five or Six or in this Part."*) it is a specific "residual" category of acts which cannot be classified in their legal form under other regulations under the Administrative Code. On the other hand, the provisions for other administrative acts under the Administrative Code apply to their issuance by analogy or proportionately.

4. ADMINISTRATIVE ACTS OF A MIXED NATURE

Administrative acts of a mixed nature (also called 'measures of a general nature'), standing on the borderline between legal acts and administrative decisions, are administrative acts which exhibit some features of normative administrative acts and some of the individual administrative acts (Průcha, 2012, p. 302; Sládeček, 2013, pp. 168-169; Dienstbier, 2007, p. 17; Hrabák, Nahodil, 2009, p. 448). In Section 171 of the Administrative Code, the legislator introduced the designation of **measures of a general nature** in the Czech legal system with a negative definition that they are neither a legal act nor an administrative decision. This institute aims to fill a particular gap between these primary forms of administrative acts when it is necessary to adopt an administrative act that combines both. It follows from case law that a measure of a general nature *"represents a bridging of the two basic forms of unilateral administrative acts traditionally used in public administration: normative (abstract) legal acts on the one hand and individual (concrete) legal acts on the other. In certain situations, however, the activity of public administration requires the adoption of administrative acts that are not exclusively normative or individual but are a certain combination of them; they are thus administrative acts of a mixed nature with a specifically defined subject of regulation and a generally defined range of addressees."* (cf. the ruling of the Constitutional Court of 19 November 2008, Case No. Pl. ÚS 14/07).

The aim of a measure of a general nature is not to replace the issuance of the aforementioned acts, nor to create an alternative to these forms of state administration, but to create an institute that combines both of these acts (Vedral, 2012, p. 1330). In simple terms, this act can therefore be characterised as having a defined subject matter, a general range of addressees to whom it is addressed and a binding nature. In more detail, it can be stated that *"A measure of a general*

nature is an administrative act with a specifically defined subject matter (i.e., it relates to a spe-cific situation) and a generally defined range of addressees. [...] A measure of a general nature cannot replace sub-legislative normative work or impose new obligations beyond the scope of the law; it serves only to specify existing obligations arising from the law and not to impose new obligations not contained in the law.” (Kocourek, 2010, p. 132). Therefore, it is possible to speak of a measure of a general nature as an act of a general-specific nature (i.e. as a combination of generality from a normative legal act and specificity from an individual administrative act) (Kocourek, 2012, p. 185). Another specificity of this institute is that the Administrative Code does not stipulate in which cases and possibly under what conditions a measure of a general nature is issued and leaves this issue entirely to specific laws (including those from environmental law).

Moreover, the Administrative Code even allows these laws to determine a different procedure from a procedural point of view than it provides for (Vopálka, 2005, p. 230). There has been a relatively complex legal debate in legal scholarship and jurisprudence as to whether only those acts which are formally designated as such should be considered as measures of a general nature or whether these acts should be assessed according to their content (material concept) (Prů-cha, 2012, p. 305 vs Jemelka, Pondělíčková, Bohadlo, 2013, p. 719). For example, in its ruling of 5 March 2009, Case No. I. ÚS 960/08, the Constitutional Court simplistically stated that in proceedings concerning a measure of a general nature, it is necessary to examine whether or not the act in question meets the material characteristics of a measure of a general nature. After all, the material concept of this institution has recently prevailed in case law practice (cf. e.g. the judgment of the Supreme Administrative Court of 22 July 2016, Case No. 2 As 78/2016-72, in which the Supreme Administrative Court wholly inclined towards the material concept, in a case concerning the environment, when it stated that the prohibition of entry into a hunting ground is a measure of a general nature even though Section 66 of Act No. 449/2001 Coll, on hunting, that clearly states that an administrative decision is to be issued in this case). The case law, therefore, even admits that, based on a substantive approach, it is possible to judicially review as a measure of a general nature, quite exceptionally, even an act in respect of which the legislator has clearly expressed its will to issue it in a specific legal form (different from a measure of a general nature) and to maintain that will (there is no change in the legal regulation in that respect). However, these are cases in which this form can only be overturned for judicial review by the Constitutional Court, *“which - without exceeding its jurisdiction - may intervene in cases where the legally prescribed form of the act does not correspond to its content”* (judgment of the Supreme Administrative Court of 21 January 2011, Case No. 8 Ao 7/2010-65). From the point of view of the topic of this article, it can be concluded that a measure of a general nature terminates several processes of public construction law with an environmental element (for all of them, in particular, the territorial development plan, the principles of territorial development or the territorial and regulatory plan). A measure of a general nature may also regulate relations under individual environmental law regulations - these may then be called ‘environmental’ measures of a general nature. These include, for example, exemption processes under the Nature and Landscape Protection Act or the establishment of a water resource protection zone.

5. PUBLIC LAW CONTRACTS

An atypical form of implementation of public administration, also in environmental protection, is represented by the so-called public law contracts, which are regulated in Part Five of the Administrative Code (Section 159-170). They regulate legal acts that establish, amend, or cancel rights and obligations in public law, not excluding the environment. In the conditions of

the Czech Republic, two types of public law contracts are concluded, namely the **coordination contracts** (which are concluded between public administration entities) and the **subordination contracts** (concluded between a public administration entity and, as a rule, a natural or legal person to perform public administration tasks). The institute of public law contracts is also used in environmental law, both coordinating ones (e.g. Section 190(2) of the Building Act, which provides for the possibility of concluding a coordinating public law contract on the performance of the competencies of the construction authority) and subordination ones (e.g. For the procedural regime of public law contracts, Part One and Part Two of the Administrative Code apply mutatis mutandis, as make the provisions of the Civil Code), while for a more detailed definition of the conclusion of public law contracts, reference can be made to the current Czech legislation, which we consider to be clear and transparent.

6. FACTUAL ACTS WITH DIRECT LEGAL CONSEQUENCES AND NON-LEGAL AND ORGANISATIONAL FORMS OF PUBLIC ADMINISTRATION

To conclude this article, we will briefly comment on the remaining two types of environmental administrative law acts, which are not so fundamental to the topic of this article as to warrant more extensive attention. First, these are **factual acts with direct legal consequences**. These are operationally imposed binding orders, direct interventions by public authorities, or other enforcement actions. Such actions are then only applicable where the law allows it and only under the conditions laid down by law. They must comply with the principle of proportionality of the intervention (Průcha, 2012, p. 319). Concerning protecting environmental interests, reference should be made to the guards' powers (e.g. fishing guards, nature guards, forest guards and hunting guards).

The last acts are then **non-legal and organisational forms of public administration**, which no longer directly express legal forms of public administration implementation and may be directed to external addressees of public administration action (e.g. legally non-binding factual instructions or information). The non-legal forms of implementation also include material and technical operations (e.g. acts in the operation of the office's mailroom) (Průcha, 2012, p. 320).

7. CONCLUSION

As it is evident from the above, based on the systematisation of environmental administrative acts in the Czech legal system, it can be concluded that their legal regulation cannot be described as straightforward, which sometimes leads to interpretation problems in practice. This fact is mainly caused by the significant fragmentation of the forms of public administration activities in environmental law and the different types of acts required for individual environmental procedures. The question for the future is the possible further integration of the individual processes of public construction law and environmental administrative acts into one so-called *one-stop-shop* assessment. The idea of greater integration of processes within environmental law brings to mind the once unrealised Environmental Law Code, which was intended, at least in part, to codify the fragmented legal framework. We believe that the idea and implementation of a code of environmental law in the Czech Republic could solve many of the problems caused by the fragmentation of legislation.

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Water Quality Status in the Erzeni River, Albania over the Period 2014–2019 and Prospective Towards the Achievements of EU WFD Objectives in Its Basin

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Abstract: *Erzeni River flows through two of the most developed regions of Albania: Tirana and Durrës. Due to the concerns about potential pollution resulting from increased human activities in its basin the major driving forces and pressures were identified and the quality of the river's water was assessed based on an evaluation of physicochemical parameters based on monitoring data over the period 2014 – 2019. Based on data analysis, the evaluation of the overall water quality status has been carried out. The assessment of the physicochemical parameters measured, and the use of the Water Quality Standards methodology show a deterioration of water quality, however, this remains moderately good. A more precise quantification of pressures and consequent evaluation of impacts, though feasible, requires significant amounts of good quality data, much of which is not currently collected in Albania. Significant improvements in data collection and coordination between competent authorities will be required as part of future measures.*

1. INTRODUCTION

The Erzeni has a length of 109 km, and the drainage basin covers a total area of 760 km2. The river is at present the only river that provides sediment to the beaches in the Gulf of Lalezi. It has the lowest mean yearly water discharge (18 m³/sec) of all Albanian rivers and an average sediment load of 4 x 106 tons/year. The river has its origin in the Mali me Gropa 1,200 m a.s.l. some 25 km east of Tirana near Shëngjergji. It flows northwest through Petrelë and Sukth to the Adriatic Sea 12 km north of Durrës. The river passes through the city of Tirana, only a few kilometers from its southern end. Only a small range of hills separates the valley of the Erzeni River from the Lana, Tirana, Zeza, and Tërkuza rivers that form the Ishem River. On the southwestern outskirts of Yzberisht, the transition from the plane to the Erzeni valley is barely perceptible. The mouth is between Durres and the headland of Cape of Rodon at Lalzi bay.

In 2019 the population living in the basin was estimated by INSTAT in 289.011 people, mainly divided among the Municipalities of Durrës, Tiranë, Vorë, Durres, Kavajë, Shijak, Rrogozhinë.

The monitoring network of surface water quality (rivers, lakes, transitional and coastal waters) in the Erzeni River basins, and the associated sampling programmes, are under the competent authority of the National Environmental Agency (NEA) of the Ministry of Tourism and Environment.[3] The NEA publishes annually the National Environmental Monitoring Program, which sets out the intended monitoring sites and the target parameters.

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The laboratory of the National Environmental Agency works in accordance with the Quality Manual ISO 17025:2017 and is accredited for the main physic-chemical parameters: pH, conductivity, alkalinity, suspended solids, chemical oxygen demand, biochemical oxygen demand, nitrite, nitrate, ammonium, ortho–phosphorous and total phosphorous.

Currently, due to resource and capacity limitations, biological quality elements (BQEs) are not routinely sampled or analysed in Albania.

The water monitoring network extends across the main river only (Erzeni) and does not represent most of the waterbodies delineated in the river basins. Thus, the current NEA programme does not fulfil the compliance requirements of WFD Annex V 1.3.

Selected results from the monitoring network are shown for the parameters of BOD_5, P, and NH_4 (Table 1, Table 2, and Table 3). These three parameters are good general indicators of pollution arising from anthropogenic sources that are likely harmful to aquatic systems.

Table 4 provides the scheme for classification of the physic-chemical quality of rivers applied in Albania, which although distinguishing five classes, labelled from "high" to "bad" – is not yet designed fully in accordance with the requirements of the WFD.

Table 4. A classification scheme for assessment of physic-chemical parameters in rivers

Parameters	Unit	Parameter limit values				
		High Status (I)	Good Status (II)	Moderate Status (III)	Poor Status (IV)	Bad Status (V)
Dissolved O_2	mg/l	>7	>6	>5	>4	<3
BOD_5	mg/l	< 2	< 3,5	< 7	< 18	> 18
pH (acid)			> 6,5	> 6		
pH (alkaline)			< 8,5	< 9		
NH_4	mg/l	<0,05	<0,3	<0,6	<1,5	>1,5
NO_2	mg/l	<0,01	<0,06	<0,12	<0,3	>0,3
NO_3	mg/l	<0,8	<2	<4	<10	>10
PO_4	mg/l	<0,05	<0,10	<0,2	0,5	>0,5
Total-P	mg/l	<0,1	<0,20	<0,4	<1	>1

Source: National Environment Agency

Available monitoring data and assessment criteria do not yet allow a comprehensive assessment of the environmental state of water bodies. However, some conclusions can already be made.
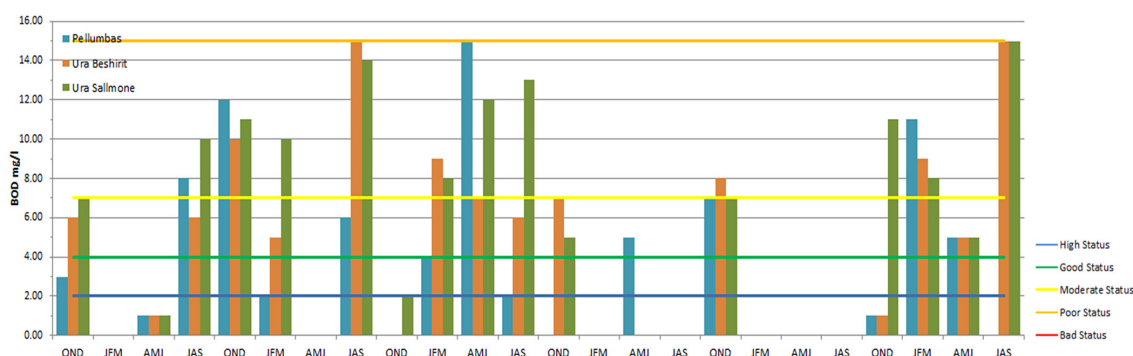
Figure 1. Surface Water Monitoring Data All Stations
– Parameter Biochemical Oxygen Demand (BOD_5)

Source: Own research

Table 1. Surface Water Monitoring Data All Stations – Parameter Biochemical Oxygen Demand (BOD5 mg/L)

STATION	2014				2015				2016				2017				2018				2019			
	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS
Pellumbas	3.0		1.0	8.00	12.0	2.0		6.0	<1	4.0	15.0	2.0	<1		5.0		7.0	<1		<1	1.0	11.0	5.0	
Ura Beshirit	6.0		1.0	6.0	10.0	5.0		15.0	<1	9.0	7.0	6.0	7.0		<1		8.0	<1		<1	1.0	9.0	5.0	15.0
Ura Sallmone	7.0		1.0	10.0	11.0	10.0		14.0	2.0	8.0	12.0	13.0	5.0		<1	<1	7.0	<1		<1	11.0	8.0	5.0	15.0

Source: National Environment Agency

Table 2. Surface Water Monitoring Data All Stations – Parameter Total Phosphorous (P mg/L)

STATION	2014				2015				2016				2017				2018				2019			
	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS
Pellumbas	0,005		0,033	0,013	0,004	0,025		0,029	0,137	0,053	0,35	0,05	0,07		0,29		0,007	0,035		0,039	0,004	0,027	0,023	
Ura Beshirit	0,26		0,029	0,043	0,012	0,022		0,073	0,166	0,046	0,05	0,063	0,082		0,05		0,074	0,044		0,031	0,007	0,033	0,011	0,01
Ura Sallmone	0,036		0,054	0,02	0,009	0,072		0,094	0,13	0,055	0,042	0,06	0,091		0,058		0,057	0,05		0,059	0,012	0,035	0,016	0,033

Source: National Environment Agency

Table 3. Surface Water Monitoring Data All Stations – Parameter Total Ammonium (NH$_4$ mg/L)

STATION	2014				2015				2016				2017				2018				2019			
	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS
Pellumbas	0.13		0.01	0.05	0.00	0.05		0.10	0.02	0.02	1.14	0.03	0.73		0.46		0.01	0.21		0.02	0.08	0.10	0.06	
Ura Beshirit	0.25		0.40	0.02	0.14	0.23		0.86	0.87	0.20	0.14	0.19	1.10		0.10		0.12	1.55		0.11	0.42	0.48	0.44	0.12
Ura Sallmone	0.38		0.15	0.05	0.33	0.12		0.61	0.13	0.42	0.27	2.08	0.38		0.09		0.16	0.34		0.04	0.43	0.23	0.10	0.29

Source: National Environment Agency

Table 5. Surface monitoring results for the Erzeni River Basin in 2019

River Basin	Monitoring station	Parameter (mg/l)						EQS
		DO	BOD$_5$	NH$_4$	NO$_2$	NO$_3$	P-Tot	
Erzeni	Sallmone - 3	7,2	6	0,25	0,05	0,6	0,09	III
	Beshiri Bridge - 2	7,8	4	0,38	0,04	0,4	0,08	III
	Pellumbas - 1	9,5	3	0,05	0,01	0,3	0,07	II

Source: National Environment Agency (www.akm.gov.al)

The levels of BOD$_5$ (Figure 1) concentrations in the Erzeni River exceed the limit of good quality in all stations except for the spring period. The concentration of BOD$_5$ indicates biological pollution and moderate quality of the river that can be attributed to discharges from urban wastewater, and farm effluents. Results of the monitoring for the year 2019 are shown in Table 5.

The content of dissolved oxygen in the waters of Erzeni is of high quality (Class I). The highest concentration of DO is measured in Pellumbas with 9.5 mg/l.

NH$_4$, NO$_3$, NO$_2$, and P-total measured in the river basin are within the EQSs indicating that the water is of good quality. The only exception is the NH$_4$ concentration at the Beshiri station, which indicates a "moderate" quality of water (Class III).

The levels of BOD$_5$ concentrations in the Drini River increase gradually from Pellumbas (where indicate good quality of water) to Beshiri and Rrogozhine clearly indicating a moderate chemical and biological quality of the river that could be attributed to discharges from wastewater, industrial effluents, and agricultural run-off.

The measurements indicate a river with water quality that is generally of moderate quality, except for the Pellumbas station which shows good quality status. Based on the above results, the status of Erzeni river waters can be classified overall as 'moderate' quality (Class III) waters. The monitoring results indicate the presence of discharges of industrial and urban wastewater and possibly agricultural run-off.

2. METHODOLOGY

The WFD requires the systematic identification of significant pressures on a river's water quality from point sources of pollution, diffuse sources of pollution, modifications of flow regimes through abstractions or regulation and morphological alterations, as well as any other pressures. 'Significant' means that the pressure contributes to an impact that may result in failing to meet the WFD objective of not having at least "good status". In some cases, the pressure from several drivers may in combination be significant.

Conventionally pressures and impacts occur either at diffuse scale or point scale. Diffuse pressures e.g., nitrate pollution from agriculture e.g., over-abstraction of groundwater - may require general environmental policies or management strategies that apply over a wider area (e.g., a sub-basin or aquifer). Conversely, point pressures such as wastewater discharges or hydropower outflows may require specific actions for individual waterbodies, although correctly determined and enforced higher-level policies should in theory prevent the need for later remedial specific measures.

The pressure assessment and resultant status are central to understanding and quantifying the gaps between environmental objectives and the current state of waterbodies in the river basin.

The assessment is necessarily a mixture of analytical and descriptive criteria depending on the level of data available. Whereas assessment of waterbody status can be a reasonably simple exercise by comparison against standards based on a single analytical sample, assessment of pressures is more complex, because *a)* pressures are typically more diffuse and harder to measure *b)* different pressures combine in complex ways to influence a water body's status.

Urbanization, industrial development, agriculture, energy production, the presence of hot spots, and urban and rural wastewater discharge are regarded as the main sources of pollution. A useful interim approach is to adopt the standard reporting procedures and codified enumeration lists set out by the WISE guidance [4] [5] which provides an "overview approach".

The logic and the methodology behind characterizing water bodies and introducing parameter limit values for the classification of ecological status for surface water and chemical status for groundwater are among others intended for making risk assessments. The risk assessment is done to identify surface water bodies at risk of not achieving at least good environmental ecological or chemical status. The methodology is to compare measured parameter values from ongoing monitoring programmes with parameter limit values applied for good environmental or chemical status. In this comparison, the parameter with the lowest quality classification is decisive for the classification of the whole water body.

3. RESULTS AND DISCUSSIONS

Urban development is a source of main points found in organic pollution that poses pressures on the water resources of the Erzeni river basin. In 2019 in the Erzeni River Basin there are a total of 3 Water Companies responsible for water supply and water services.

Table 6. Water Service Provision in the Erzeni Basin, 2019

Municipality	Population (2019)	WSS Company	Water Supply Coverage (%)	Sewerage Connection Coverage (%)	Population connected to a WWTP (%)
Durrës	190.059	Durres UK Sh.A	87,8	49,87	49,9
Kavajë	40.094	Kavaje UK Sh.A	64,91	25,72	33,4
Rrogozhinë	22.148	Rrogozhine UK Sh.A	54,17	11,38	0,0
Shijak	36.710	Bashkia Shijak	70,9	37,2	0,0
TOTAL	289.011		79,9%	42,0%	37,4

Source: National Agency for Sewerage, Infrastructure and Waste; INSTAT

The rate of population covered with supply services varies from 54% for Rrogozhine to 88% for Durres Municipality. All the Municipalities of the Basin have sewerage connections, but only Durres Municipality has a WWTP. This means that, except for Durres, wastewater is collected in public sewers and/or septic tanks and then released into the environment without receiving treatment. The main municipal outfalls have been identified by AMBU[6] (see Table 7).

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[4]   The approach adopted in the new template for RBMPs in Albania is to closely align with WISE reporting requirements in terms of feature classes and attributes. This focuses data collection only on what is needed for WISE and EIONET reporting and orientates the NWRC data structures to be broadly aligned with WFD outputs.

[5]   Water Information System for Europe – WISE GIS Guidance – on the reporting of spatial data to WISE, v 6.0.6, 2016.

[6]   Agency for Management of Water Resources

Table 7. Municipal outfalls

Municipality	WSS Company	Municipal Outfall
Kamëz	Kamez UK Sh.A	4 outfall points along the Tiranë River
Krujë	Kruje UK Sh.A	2 outfall points along the Perroi Mzeze branch of the river ishem 1 outfall at Bidrit stream 3 outfall points at Bërdharit stream 1 outfall at Gjolës River
Tiranë	Tirane UK Sh.A	38 outfall points along the Lanë River 1 outfall point at Paskuqanit stream, a branch of Lane River 2 outfall points along the Gjeroskess, a branch of Lane River
Vorë	Vore UK Sh.A	2 outfall points along the Vores stream branch of Lane River

Source: Agency of Water Resources Management

The pollution load deriving from urban waste waters can be determined (see Table 8) using the following unit values for 1 PE[7]:

- Biochemical Oxygen Demand (BOD_5) = 60g/person/day[8].
- Total Nitrogen (TN) = 11 g/person/day.
- Total Phosphorus (TP) = 2.8 g/person/day.

The amount of Tot-P, Tot-N, and BOD5 and water consumption within the basin can be calculated as shown in Table 8.

Table 8. The daily and yearly load from 1 PE and the load
from 896,275 people living within the basin

1 PE	Day	Year	896,275 PE/year
Tot-P	2.8 g	1.0 kg	896 t
Tot-N	11 g	4.0 kg	3585 t
BOD_5	60 g	21.9 kg	19628 t

Source: Own research

Industrial activities are point sources of pollution that place constant pressure on the water resources of the river basin. These mainly include:

- *The manufacturing industry* is the revenue leader sector and includes production activities of cement and construction materials; metals (iron and ferrochrome alloys); leather goods; textile goods and footwear; and aluminum for construction. 11 large industrial installations operate in the basin with Class A (IPPC compliant) permit[9] (Table 9).

However, there are no official data on the amounts of water used by this sector, nor for the quantity/quality of discharged wastewater.

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[7]   PE: Person Equivalent. Common applied values in EU countries.

[8]   The estimated organic load of 60 g/person/day corresponds to one population equivalent (PE), as defined in the Directive 91/271/EEC.

[9]   The current Albanian permitting system in relation to environment protection is established by the Law on Environmental Permitting No. 10488 Dated 14.7.2011, which provides the basic principles for the environmental permitting process. The Law establishes a three-tier system for permits of installations and activities, namely: Class A, Class B, and Class C Environmental Permit. These three are distinguished from each other by the thresholds of industrial activity, production, and capacity. A Class A permit shall take into account the environmental performance of the installation or the activities as a whole. The permit set emission limit values for pollutants, according to Best Available Techniques. *The Class A permit is aligned to the EU IPPC permit.*

Table 9. Large industrial installations within Erzeni River Basin

Municipality	Product or processing	Activity by EU Sector
Durres	Collection, recycling, and melting of batteries for lead production	Waste, Metallurgy
Durres	Sugar production plant	Misc.
Durres	Production of cast aluminum	Metallurgy
Durres	Bricks factory	Mineral
Durres	Recycling of lead from used batteries	Metallurgy
Durres	Plant for recycling scrap metal	Metallurgy
Durres	Factory for the processing of the medicinal plants	Chemistry
Durres	Tires and plastic materials pyrolysis	Chemistry
Durres	Cement production	Mineral
Durres	Processing of organic fertilizers	Misc.
Durres	Batteries recycling	Waste, Metallurgy

Source: Own Research

Agriculture and farming activities are diffuse sources of organic and inorganic pollution (mainly BOD, nitrogen, and phosphorus) that place constant pressure on the water resources of the river basin as they may cause deoxygenation and eutrophication of surface waters and contribute to declining fish stocks, and a loss of biodiversity.

Agriculture run-off also remains a challenge for river pollution as it is a major contributor to the eutrophication of freshwater bodies. The effects of agriculture (and animal farming) on the status of surface water can be separated by point and diffuse sources.

Regarding the point sources, there are discharges of wastewater from livestock farms and slaughterhouses. The table below (Table 10) prides an overview of the farming and food processing installations under Class A (IPPC compliant) permit requirements. However, no actual information is available on the loads from these installations.

Table 10. Large livestock farms and slaughterhouses by basin

Basin	District	Product or processing
Erzeni	**Durres**	Chick farm and eggs production
		Pigs farm
		Chick farm and eggs production
		Plant for livestock food production
		Chick farm and eggs production

Source: Own Research

Mineral fertilizers, such as nitrogen (N) and phosphorus (P), are widely used in agriculture to optimize production. They are important nutrients that are absorbed from the soil by plants for their growth. A surplus of nitrogen and phosphorus can, however, lead to environmental pollution like the eutrophication of surface water.

Albania's mineral fertilizer consumption fluctuated substantially in recent years, it tended to increase through the 2002 - 2019 period and was 126.14 kg/ha of arable land.[10]

The yearly fertilizer consumption in the Erzeni basin is estimated at 4,812 ton/ha. Based on the information on fertilizers usage it is possible to estimate the usage of different nitrogenous and phosphorus fertilizers in the river basin as shown in Table 11.

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[10]   Source: https://data.worldbank.org/indicator/AG.CON.FERT.ZS?locations=AL

The main pollutants related to animal farming are BOD, nitrogen, and phosphorus. The estimation of the pollution loads can be made by knowing the livestock's number, based on emission factors considering local experience and data reported in the literature.[11] Based on livestock structure data from the Albanian Institute of Statistics (INSTAT), the total load for N and P from animals in the Erzeni basin can be estimated as follows (Table 12). The total amount of nitrogen and phosphorus generated or applied from the above sources can be summarized as shown in Table 13.

Table 11. N and P from fertilizers – Nitrogen and Phosphorus fertilizer use
(a ton of fertilizer and an equivalent ton of N and P), 2019

Basin Erzeni	
Urea Nitrogen (tonnes)	1.877
containing 46% N (tonnes)	863
Ammonium Nitrate (tonnes)	1.732
containing 34.5% N (tonnes)	598
Tonnes of Nitrogen applied	**1.461**
Super Phosphate (tonnes)	1.203
containing 7.07% P(tonnes)	85
Total Phosphorus applied	**85**

Source: Own Research

Table 12. Estimate load of N and P from livestock

Animal Category	Erzeni	
	N load (ton/year)	P load (ton/year)
Cattle	1854	206
Sheep	592	101
Pigs	123	36
Equidae	17	4
Poultry	95	63
Turkeys	8	4
Total	**2690**	**414**

Source: Own Research

Table 13. The total amount of nitrogen and phosphorus generated
or applied within Erzeni Basin area

	Total N load (t/year)	Total P load (t/year)
Total from fertilizer (tonnes)	1.461	85
Total from livestock (tonnes)	2.690	414
Total	*4.151*	*499*

Source: Own Research

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[11] Data on livestock manure characteristics presented are obtained by combining a wide base of published information on livestock manure production and characterization. Actual values vary due to differences in animal diet, age, usage, productivity and management. Whenever actual sample analyses can be performed, such information should be considered in lieu of the mean values presented here.

Fresh manure characteristics per 1000 kg live animal mass per day

Parameter	Unit	Animal Type						
		Cattle	Cows	Sheep / goats	Swine	Equines	Poultry	Turkey
Total N	Kg	0,45	0,34	0,41	0,48	0,3	0,33	0,52
Total P	Kg	0,05	0,092	0,07	0,14	0,07	0,22	0,23

The pollution by livestock in each of the basins can be calculated by considering a typical live animal mass of cattle 450 kg; swine 150 kg; sheep/goat 50 kg; horse 200 kg; poultry 0.8 kg; turkey 3.5 kg.

Solid Waste Disposal. Random disposal of waste on land and along watercourses is common and represents a major problem in the basin. Waste disposal might more appropriately be addressed as a source of diffuse pollution.

Dumping in poorly managed landfills is the main method of municipal solid waste disposal. These sites lack the necessary infrastructure or engineering provisions to collect and contain landfill leachate and gas.

Five dumpsites exist at Rrogozhina (located on the banks of a stream), at Manez (located at the end of a very poor dirt track although unusually for Albania the site is fenced), at Sukth (located on flat terrain adjacent to a small irrigation type canal), at Shijak (located next to a graveyard at the end of a very poor access track), and at Durres, which is a large site on flat wetland terrain.

4. CONCLUSION

The table below (Table 14) presents a final register of the identified pressures, an estimation of the waterbody's status, and an estimation of the waterbodies at risk of failing the environmental objectives.

Available monitoring data and assessment criteria do not yet allow for a comprehensive assessment of the environmental state of water bodies in the Erzeni basin. Generally, Erzeni is moderately polluted largely due to the discharges of untreated wastewater and agriculture activities. This implies that the river will not comply with the WFD criteria for "good" status.

Table 14. Pressure type identified and quality status analysis

PRESSURE TYPE				WATER QUALITY STATUS							RISK ASSESSMENT
				(Yearly average concentrations not meeting the Albanian thresholds for "Good" status)							
POINT PRESSURE	DIFFUSE PRESSURE	ABSTRACTION PRESSURE	Hydrological Alteration	BOD₅	NH₄	NO₂	NO₃	Ptot	OVERALL STATUS	RISK LEVEL	
Urban Wastewater	Agriculture Runoff	Agriculture	Gravel extraction	x					Moderate	Probably at risk	
Industrial Pollution	Mining Contamination										
Solid waste disposal											
Aquaculture Farm Fish											

Source: Own Research

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Sustainability in Software Engineering:
A Design Science Research Approach

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Abstract: *In the current global context, with so many challenges to be faced, it is important to see people's increased interest in sustainability issues as an opportunity for change. Sustainable Software Engineering, as a recent research area, incorporates sustainability principles and dimensions in the software development process. On the other hand, the Design Science Research methodology has become a well-received research paradigm in Information Systems in general and in Software Engineering in particular. The paper presents a Sustainable Software Engineering approach integrated into the Design Science Research methodology. The concepts of sustainability in software development, namely the principles of the Karlskrona Manifesto, the principles of Green Software Engineering and the Sustainable Development Goals are integrated into the approach. Preliminary results from applying the approach indicate that the iterative process of the Design Science Research methodology allows for the integration of multidisciplinary sustainability artefacts during the software process.*

1. INTRODUCTION

Software Engineering is an area of knowledge in constant evolution facing new challenges and sustainability is now seen as a central concern. The use of Information and Communication Technologies (ICT) can enhance the transformation of Society by incorporating sustainability concerns, including the Sustainable Development Goals (SDG).

The paper presents an approach that integrates the concepts of sustainable Software Engineering in the phases of the Design Science Research methodology for the construction of the artefact. These concepts of sustainability in the software process include the principles and commitments of the Karlskrona Manifesto, the principles of Green Software Engineering, and the 17 United Nations Sustainable Development Goals. The principles of the Manifesto for Energy-aware Software were also considered.

The work developed in this paper is structured in six sections: introduction to the problem under study, the research methodology, the main topics of the background research, approach design to sustainability software engineering, future research directions and conclusion.

2. METHODOLOGY

The research methodology adopted is Design Science Research. The DSR methodology is a tool to improve methods in software engineering research and to offer specific guidelines for the development and evaluation of artefacts. With reference to the characteristics of the five types/genres (Peffers, Tuunanen, & Niehaves, 2018) of research approaches identified in the literature, the Design Science Research methodology is used from Peffers' perspective, as it includes the

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necessary characteristics to be applied in Software Engineering, namely: focus on the development of practical artefacts; flexible and iterative process; the role of theory: generalizability, reasoned argument that an artefact can work; evaluation: outcome-oriented, practical.

The process of the DSR methodology is shown in Figure 1. The Design Science Research methodology includes six steps (Peffers, Tuunanen, Rothenberger, & Chatterjee, 2007): problem identification and motivation, definition of the objectives for a solution, design and development, demonstration, evaluation, and communication.
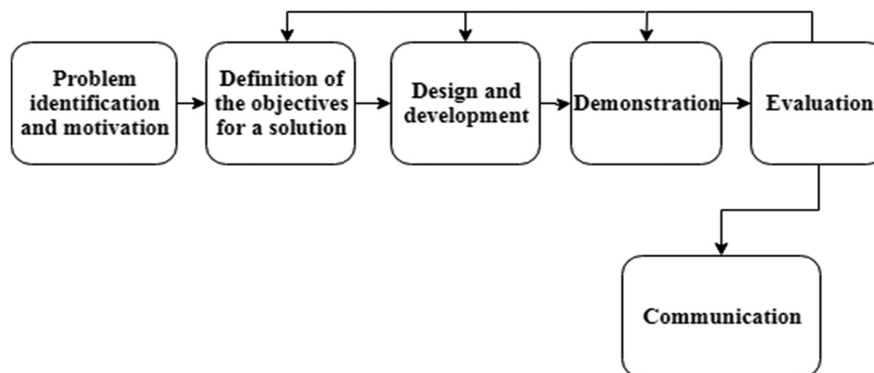
Figure 1. Design Science Research Process
Source: Adapted from (Peffers, Tuunanen, Rothenberger, & Chatterjee, 2007)

3. BACKGROUND RESEARCH

The study of sustainability in the field of software development is very important in order to promote the integration of the 17 SDGs outlined by the United Nations. On 25 September 2015, the United Nations General Assembly adopted the 2030 Agenda for Sustainable Development (UNDP, 2022), setting out 17 goals and 169 targets, covering social, economic and environmental dimensions around the world (Figure 2).

Figure 2. 17 Sustainable Development Goals
Source: https://sdgs.un.org/goals

The SDGs focus on people, human rights and responding to growing social inequalities, as well as core concerns such as peace, security and climate change. The SDG fundamentally targets the "5P": People, Prosperity, Partnership, Peace and Planet.

In the study (Wu, Guo, Huang, Liu, & Xiang, 2018) on the correlations between the SDG and ICT, several gaps were identified in the three pillars of sustainable development: social, economic and environmental perspectives. There is therefore a need to raise awareness and draw attention on how to innovate in ICT to better help all nations achieve the SDG by 2030. In this sense, ICT can enhance the transformation of Society by incorporating sustainability concerns, including the SDG. In this sense, it becomes essential to include sustainability in software development.

P#	Principles descriptions
P1	**Sustainability is systemic:** Sustainability is never an isolated property. Systems thinking has to be the starting point for the transdisciplinary common ground of sustainability.
P2	**Sustainability has multiple dimensions:** We have to include those dimensions into our analysis if we are to understand the nature of sustainability in any given situation.
P3	**Sustainability transcends multiple disciplines:** Working in sustainability means working with people from across many disciplines, addressing the challenges from multiple perspectives.
P4	**Sustainability is a concern independent of the purpose of the system:** Sustainability has to be considered even if the primary focus of the system under design is not sustainability.
P5	**Sustainability applies to both a system and its wider contexts**: There are at least two spheres to consider in system design: the sustainability of the system itself and how it affects sustainability of the wider system of which it will be part.
P6	**Sustainability requires action on multiple levels:** Some interventions have more leverage on a system than others. Whenever we take action towards sustainability, we should consider opportunity costs: action at other levels may offer more effective forms of intervention.
P7	**System visibility is a necessary precondition and enabler for sustainability design**: The status of the system and its context should be visible at different levels of abstraction and perspectives to enable participation and informed responsible choice.
P8	**It is possible to meet the needs of future generations without sacrificing the prosperity of the current generation:** Innovation in sustainability can play out as decoupling present and future needs. By moving away from the language of conflict and the trade-off mindset, we can identify and enact choices that benefit both present and future.
P9	**Sustainability requires long-term thinking**: We should assess benefits and impacts on multiple timescales, and include longer-term indicators in assessment and decisions.

Figure 3. Principles of KarlskronaManifesto
Source: Adapted from (Becker et al., 2015)

The concept of sustainability in Software Engineering is often referred to following the Karlskrona Manifesto (Becker et al., 2015). This manifesto serves as a guide for designing and developing more sustainable software systems. Figure 3 shows the nine principles of the Manifesto.

Sustainable software engineering is a means of developing sustainable software in which the process activities balance the various dimensions of sustainability, namely, the individual, social, economic, environmental, and technical dimensions. Figure 4 illustrates these five dimensions from the perspective of the Karlskrona Manifesto (Becker et al., 2015).

It is considered that, concerning the dimensions of sustainability (Figure 4), ICT can enhance the incorporation of these dimensions to include concerns in the field of software reuse, opensource, cloud computing, virtualisation, process dematerialisation, digital transformation and information security (Reis, Carvalho, Silveira, Marques, & Russo, 2021).

The authors (Fonseca, Kazman, & Lago, 2019), advocate that this may be an opportunity for the R&D community to apply the nine principles of the "Manifesto for energy-aware software" to foster energy awareness as an ICT sub-discipline, thus enhancing software engineering practices. In this sense, it is considered that successful application may depend on three fundamentals: awareness; the creation of a body of engineering knowledge; education and training.

Sustainability dimensions

- **Individual**: refers to the well-being of humans as individuals. This includes mental and physical well-being, education, self-respect, skills, mobility, etc.;
- **Social**: concerned with societal communities (groups of people, organizations) and the factors that erode trust in society. This dimension includes social equity, justice, employment, democracy, etc.;
- **Economic**: focused on assets, capital and added value. This includes wealth creation, prosperity, profitability, capital investment, income, etc.
- **Environmental**: concerned with the long term effects of human activities on natural systems. This dimension includes ecosystems, raw resources, climate change, food production, water, pollution, waste, etc.;
- **Technical** : refers to longevity of information, systems, and infrastructure and their adequate evolution with changing surrounding conditions.

Figure 4. Sustainability Dimensions

Source: Adapted from (Becker et al., 2015)

Green Software Engineering is an emerging discipline that is based on the eight Green Software Engineering Principles (Figure 5) in order to list the necessary skills to define, build and execute applications interconnecting software, hardware and data center design practices and architectures, among other areas (Microsoft, 2022). These principles include concerns about creating and optimizing applications that are carbon and energy efficient, reducing the amount of data and the distance it must travel across the network.

Principles of Green Software Engineering

1. Carbon: Build applications that are carbon efficient.
2. Electricity: Build applications that are energy efficient.
3. Carbon Intensity: Consume electricity with the lowest carbon intensity.
4. Embodied Carbon: Build applications that are hardware efficient.
5. Energy Proportionality: Maximize the energy efficiency of hardware.
6. Networking: Reduce the amount of data and distance it must travel across the network.
7. Demand Shaping: Build carbon-aware applications.
8. Optimization: Focus on step-by-step optimizations that increase the overall carbon efficiency.

Figure 5. Green Software Engineering Principles

Source: Microsoft, 2022.

4. APPROACH DESIGN

The concepts of sustainability in software development, namely the principles and commitments of the Karlskrona Manifesto, the principles of Green Software Engineering, the principles of the Manifesto for Energy-aware Software, and the 17 United Nations Sustainable Development Goals are considered in the steps of the DSR methodology for the construction of the artefact. Table 1 presents the phases of the DSR methodology with the incorporation of the principles of the Karlskrona Manifesto described in Figure 3.

Table 1. Karlskrona manifest principles applied in the DSR phases

DSR Phase	Karlskrona Manifesto principles that apply
Problem identification	P1, P3 and P5- Ensuring that sustainability is considered from the moment the problem is identified, making it possible to develop a solution with systemic value. The analysis of the problem involves elements from several disciplines with transversal knowledge of the processes that must incorporate sustainability concerns. Sustainability applies to both a system and its wider contexts: assessing the impacts arising from the definition of the problem and the environment in which the solution will operate.
Definition of the objectives	P1, P2 and P3- Sustainability is systemic and has multiple disciplines and dimensions: Software sustainability has different disciplines/dimensions that must be considered when defining the objectives of a solution.
Design and development	P2 and P4- Sustainability has multiple dimensions and is independent of the purpose of the system: during the creation of the artefact, consider the different dimensions of sustainability (technical, social, environmental, economic and individual) to determine the desired functionality.
Demonstration	P2, P6 and P7- When demonstrating the artefact, it must have implicit actions that promote the inclusion of the various dimensions of sustainability, namely: technical, economic, social, environmental and human. This way it will allow the visibility of sustainability actions at different levels of abstraction.
Evaluation and communication	P6, P8 and P9- Involve the community in evaluating the adequacy of the artefact in solving the problem and scientifically disseminating the added value of the solution.

Table 1 can be extended to incorporate the SDG, the principles of Green Software Engineering and the principles of the Manifesto for Energy-aware Software. In this perspective, this approach proposes the application of the phases of the DSR methodology incorporating the principles and dimensions of sustainability in order to create artefacts that assertively contribute to solving the various problems, given the current challenges of sustainability (Figure 6).
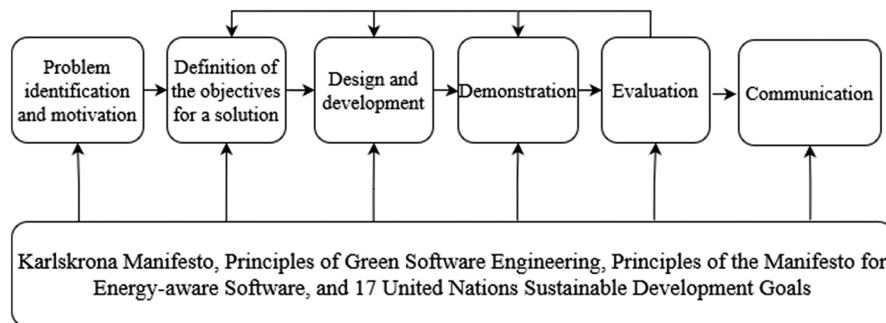
Figure 6. DSR methodology incorporating the principles and dimensions of sustainability
Source: Adapted from (Peffers, Tuunanen, Rothenberger, & Chatterjee, 2007)

The DSR methodology incorporating the principles and dimensions of sustainability is a tool that offers specific guidelines for the development and evaluation of artifacts (namely software products).

5.   FUTURE RESEARCH DIRECTIONS

Previous studies on the integration of the principles and commitments of the Karlskrona Manifesto in software development (Ovelheiro, Silveira, & Reis, 2021; Silveira, & Reis, 2021), made it possible to explain to developers and stakeholders which principles of sustainability to apply in the implementation of the use case. Also (Reis, & Silveira, 2020) show that it is possible to assess the implementation of awareness-raising actions through the SDG.

In future work, we intend to continue teaching the incorporation of the principles and dimensions of sustainability in software development and include applying the approach to academic co-creation projects with organizations.

6. CONCLUSION

Sustainability in ICT, and more specifically in Software Engineering, was the main concern of this paper. Software Engineering can present itself as an interesting contribution with regard to the inclusion of sustainability, namely by incorporating sustainability principles and dimensions in the software development process. The developed approach integrates sustainable Software Engineering with the Design Science Research methodology, allowing the creation of artifacts that meet sustainability.

Preliminary results from applying the approach indicate that the iterative process of the Design Science Research methodology allows for the integration of multidisciplinary sustainability artefacts during the software development process.

Sustainability concepts in the software development process may include the principles and commitments of the Karlskrona Manifesto, the principles of Green Software Engineering, the principles of the Manifesto for Energy-aware Software, and the United Nations' 17 Sustainable Development Goals.

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Person with Schizophrenia and Negative Symptoms in COVID-19 Era: A New Evolution for Treatments and Economy

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Abstract: *In the last two years, the COVID-19 pandemic has become part of people's lives, including those diagnosed with schizophrenia. Many have also exacerbated negative symptoms of the disease such as anxiety, increased hallucinations, and depressive symptoms. To overcome the illness, the wishes of the patients were investigated. Subsequently, starting from the personalism philosophy point of view, for a little group of the Day Care Service, a program (that has integrated pedagogical interventions, educational groups, psycho-educational interventions, social skills training and telephone support) has been created to decrease the negative symptoms of schizophrenia and improve the psychophysical well-being of each patient. This research shows that it is possible to introduce a clinical-pedagogy perspective for the care of schizophrenia patients and to mitigate the negative symptoms of schizophrenia.*

1. INTRODUCTION

The COVID-19 pandemic[2] has changed people's life habits and psychophysical balance. Many Italian schizophrenic patients in charge of the Day Care Service began to increase the negative symptoms of the disease (hallucinations, anxiety, deflection of mood…). Progressively these people were no longer able to perceive that their life could take place constructively even during the pandemic period. For this reason, with four patients (between 42 and 58 years old) a project was structured that allows them to regain their *being in the world* starting from a common desire. Through a program that has integrated pedagogical interventions, educational groups, psycho-educational interventions, social skills training and telephone support the operators have built the conditions to allow these people to go on holiday outside the region. The positive results of the project demonstrate how it is essential to develop pedagogical, educational and rehabilitative interventions to care for schizophrenia people. In this way they can re-invest themselves in their life project even in critical world events such as SARS CoV-2.

2. SCIENTIFIC FRAMEWORK

In the 1960s, thanks to the idea of Basaglia (1968, 2000, 2014), onwards in Italy a period of reflection on the care of psychiatric patients has begun. According to Agazzi (1965, 1981) and Cancrini (1974) institutional interventions have been created to preserve psychophysical health at an early age. In agreement with De Sactis (1924, 1963) and Bertagna (2006,2015), the attention of the Italian government to the personalism philosophy has created an attitude in the operators to increase the *ad personam* intervention in different fields (education, health care system…). As reported by Medea (1963) and Galbusera (2020) this approach is part of the Italian

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[1]   ASST Lecco, Via Eremo 9/11, Lecco, Italy
[2]   The Corona Virus Disease 2019 (COVID-19) started in China in December 2019 and in March 2020 it has spread all over the world.

culture and it differs from the Anglo-Saxon model to provide care, assistance and rehabilitation to its citizens. The group of Fusar-Poli (2017)[3], Kępińska (2020)[4], Kozloff (2020) and Brown (2020) underline that during the Covid-19 pandemic the story of how psychiatric patients experienced this event was useful to create intervention programs. For example, the experience of social distancing and movement restrictions (useful information to reduce the contagion of COVID-19 such as said Center for Diseas Control (2003)) led according to the group of Gardner (2015), Rubin (2020), Duran (2020), Wang (2020), Anglin (2020) to negative social and psychological outcomes, including loneliness, depression and anxiety mostly in vulnerable population and it contributed to increasing the perception of patient's discomfort. As Wang and colleagues (2020) argued, in fact, anxiety symptoms were rated as the common psychological problem in the COVID-19 period. Furthermore, for Wallace's group (1980) the self-reported poor physical health status associated with the presence of a chronic illness favored in the patients the spread of anxiety and depression symptoms. As reported by Mounier (1948, 1964) and Bertagna (2015) these elements and the personal experience that the patient has lived during the pandemic have been the pillars to create education and rehabilitation treatments.

Through the use of pedagogical interviews by Galbusera (2020), educational groups, treatment groups suggested by Turner and colleagues (2017), in particular social-skills training indicated by Gohar's (2013) and Horan's (2009) groups, psycho-education training as showed by Patterson's group (2006) and Xiang's group (2007) and telephone support disclosed by Guimond and colleagues (2019) an educational and rehabilitative opportunity has been structured for four psychiatric patients who, overcoming their resistance to change and the negative symptoms of schizophrenia (specified to research groups led by Kay (1987), Fusar-Poli (2015) and Velthorst (2015), managed themselves to fulfill a wish (according to Galbusera (2018) also thanks to the theoretical gaze of personalism).

3. DATA COLLECTION AND PROCEDURES

Pre and post-intervention data is collected using self-report instruments and interviews. The participants have been informed about the purpose of the study. They have also been informed that participation is voluntary and anonymous, that data is kept in a safe only the research group can access it, that it is also possible to withdraw consent without explanation, that the results only are reported, so the identity of the participants is protected. The results can be reported at the conference and in a scientific journal.

4. PROJECT

In the COVID-19 pandemic, many schizophrenia people have exacerbated negative symptoms of the disease. For this reason, individual pedagogical interviews were carried out with the aim of identifying the triggers of the discomfort. For these people, the common emotion was fear (especially of death). Often the fear has been somatized by patients with a constant stay in bed[5]. During the interview, the experience of living in fear was associated with other dimensions such as apathy and anguish, the ideation of negative thoughts about one's own health, the fear of not having the

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[3] It is important to remember that Fusar-Poli and colleagues argue that the association between psychosis and psychosocial events (like stressful life events) may worsen symptoms.

[4] It should be emphasized that in the literature there is already a scientific contribution that has been involved in relating the mental health condition of psychotic person with the pandemic time (in particular Spanish Flu).

[5] This emotion decreased slightly only when the patient had the day of attendance in Day Care service.

energy to get out of bed, stand and move, the perception of being about to experience physical and intellectual death. Among the patients' interviews, ten of them recalled how much the idea of organizing a holiday could be a good motivation to get out of the loop of negative thoughts. Of these ten people, only four have agreed to develop this desire even by realizing it. A common feature of this group was sharing a holiday that has been organized by a voluntary association, a few years before the pandemic. Considering the contents of the interview and the motivation for the project itself, after a week, the operator organized a second individual meeting where three elements were gathered: the memories of the subject about the last holiday (which took place three years earlier), the positive thoughts that have been generated and the difficulties encountered. The four guests of the daycare remembered this experience with great joy and satisfaction. They discussed some critical difficulties. They recalled the strategies used to overcome any inconveniences. They identified the idea of organizing a new holiday as an opportunity to escape from the loop of negative thoughts that constantly were undermining the current psycho-physical balance. In the first two talks, it was decided to carry out the desire of patients to leave for a holiday by structuring an intervention program. Group interventions were carried out (social skills training, psycho-education groups, educational groups) with the aim of having in relation the four patients who have shown to have a common interest. Among the objectives of the intervention there was the idea of using their *status quo* as change motivation to contain/limit the persistent and current negative symptoms of schizophrenia and to involve them in building a positive life experience.

Interventions lasted sixty minutes and each has been organized every two weeks. In the first three meetings of the educational matrix, the memory of the experience conducted three years earlier was shared with the group, sharing the common desire of patients to face a new holiday, the impossibility of being able to carry out this project with the association of volunteers (that due to the pandemic would not have activated this initiative) and the availability of operators to support patients in the construction of this project. Given the current fear about SARS CoV-2 two psychoeducation meetings were held where some results of scientific research on coronaviruses (and some behaviors) have been shared to contain the risk of contagion (including the current use of personal protective equipment and their disposal in waste, the hygiene of the person, the living environment and the clothing worn) and presented.

During these two meetings, some questions emerged in the patients. 4 out of 4 patients raised some elements that were collected by the operators and addressed in an educational group. Three topics were discussed. The first concerns the feeling of anguish and fear that is activated especially when listening to the news on the TV[6] (4 out of 4 patients had this concern). The second is regarding the mortality rate[7] (2 out of 4 patients shared this theme). The third con-

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[6]   The central theme concerns the fact that for many months now the first news on TV has always been linked to the disease of COVID-19 (numbers of hospitalized, deaths, lockdowns, vaccines, vaccination obligations…). Actually, when the operator reported that there were days when the first news was not directly related to the virus, all patients said that they did not notice the fact.

[7]   The patient 1 brought to the attention of the group that in the current year there were more deaths than in previous years. He consulted the data collected by ISTAT-Istituto Nazionale di Statistica (The agency identified the total deaths of Italian citizens in 2020 compared with the average 2015-2019). Hence the concern that, despite the decrease in infections, COVID-19 disease was not really under control. (It should be noted, however, that the patient looked at Italy's mortality rate and not the data regarding the mortality rate from COVID-19). The patient 2 commented on the increase in the mortality rate of Italians based on the news learned through newspapers and television news. In the patients' statements on this issue there is a sense of alarm and a difficulty in thinking critically about the shared elements. In the discussion it emerges that part of the concerns related to the awareness that the Italian authorities have extended the state of emergency until 31 December 2021 and, therefore, according to the interpretation of the patients, to the fact that it

cerns the choice of the Italian government to include a green pass as a device that can allow inhabitants to access social places such as cinemas, theaters…[8] (element examined by 3 out of 4 patients). Subsequently, five meetings about social skills have been organized. The themes were: relationship ability, the ability to manage daily life in the territory where they would stay for the holidays and the skills to manage emergencies. Finally, at the end of the interventions, a last educational meeting was structured where the work carried out with the group was shared.

It should be emphasized that, during the group interventions, in order to better promote the harmony of the working group and to contain the negative consequences of social distancing that often emerged as an experience still very present in the stories of the participants, the knowledge among the members of the group has been encouraged even outside the Day Care service. As underlined by teams Fortuna (2019) and Aschbrenner (2018) one tool used was the phone[9] that favored peer support among patients.

One week after the training, each patient received a pedagogical interview where the person's motivation for the holiday was evaluated, the current persistence of fears regarding the SARS-Cov-2 and the comparison between the perception of the negative symptoms of schizophrenia of the first encounter with those possibly present in the second meeting. In this last interview, each patient showed less concern about the disease from COVID-19, a major decrease in the negative symptoms of schizophrenia and a lot of motivation for the ongoing project.

About three weeks later, the patients left for the sea. On the week before departure, 1 patient out of 4 began to accuse big anxiety and apathy. For him usually, be-weekly access to Day Care service and a daily interview have been arranged (remotely if the patient was not on the day of attendance) to restore a greater psychophysical balance.

Three days before departure for the other patients a remote pedagogical interview was established to monitor the psychophysical balance of each person and the motivation to carry out the project. During the last meeting, an agreement was reached. The indication given to each patient was that, during the holiday, in case of need, it would have been possible to contact an operator of the center by phone (from 8.30 to 16.00 from Monday to Friday).

All the patients went to the sea (departing on Sunday). During the week, by personal choice, two patients called the operator daily to update him about the weather, food and service offered

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is still necessary to be very careful about the lethality of the virus.

[8] The patient 1 who first deal with this topic wondered why this device would become necessary to attend some places. The patient had previously shared the matter with the priest of the Catholic Church he was attending. With this intervention he tried to understand if the cinema and/or the municipal market were places with a greater risk of contagion than the church (which presumably would not have been subject to this indication). Patient 2 dealt with the topic by correlating it to the fact that attending in the winter would allow access only to guests with green pass. Patient 3 heard about the green pass at the bar. In this case he took the information without really understanding the use of the certification and when to use it. Patient's interventions on the issue gave rise to a subsequent reflection that led to a work. It was a matter of identifying the public places that the patients of the group habitually attend to detect the behavior of the people they meet and the use of protective equipment, the different level of risk of the places under consideration and, during the holiday, on what social occasions he would be required to exhibit the green pass. Among the places detected are the open-air market (for 4 out of 4 patients), the bar (for 4 out of 4 patients) and the church (for 2 out of 4 patients).

[9] With the aim of increasing the use of the phone by patients and, through technology, to provide them with a tool to overcome social isolation scientists from the group of Frith (2015) argued that, compared to the general population, people with psychosis have less access to mobile phone and technology.

by the hotel (one of them was the patient who have felt bad just before leaving). The other 2 patients contacted the operator 3 days a week discussing the same issues as the patients who called every day. During the telephone interventions in no case patients report discomfort. Two days before returning 2 patients out of 4 asked the operator to be helped to organize the activities to be done on the day of return (deciding what time to set the alarm clock, when to pack their bags, and whether to buy food for the trip, etc.).

Upon returning from vacation, after four days, an educational group activity was carried out where the critical issues emerged and the strengths of experience. Subsequently, after a week, an individual pedagogical interview, lasting about forty-five minutes, has been organized. The topics have been: the details of the experience analyzed and compared with those that have occurred a few years earlier; the current psycho-physical well-being of the patient; the futuristic proposals. The story showed a good psychophysical balance and less fear of SARS Cov-2. Everyone pointed out that if they had to choose between the proposal to organize a holiday independently with a group of friends or participating in a holiday accompanied by a group of volunteers all would have headed towards the second hypothesis. All patients highlighted the same motivations: economic element (going with association costs less), and emotional element (in the holiday with the association the patient feels reassured by the presence of the volunteer 24 hours a day). No patient thought about the hypothesis that two holidays could be organized: one independently and the other with volunteers.

Among the elements to be emphasized during this experience emerges the repercussion that the holiday project has had in general the group of patients attending the Day Care service[10]. In fact, five other patients diagnosed with schizophrenia have moved away from their region by organizing a week-long holiday with family members.

5.   CONCLUSION

This research experience has shown that, during COVID-19, the pedagogical perspective of personalism contributed to the construction of the well-being of the schizophrenic patient. Through this method, the patient regained his *being in the world*, felt again like a human person and questioned the reasons that led him to live almost alone with the identity of a schizophrenic. Each person has become an active citizen in the world and a customer of non-health services only. A further element to be taken into consideration (to be valued and to be developed more with regard to the evaluation of the results) concerns the effects (social, health, cultural, economic…) that an intervention (in this case done on a group of people) has, in general, people who attend the same context.

6.   LIMITATIONS AND FUTURE PROJECT

This study has a limitation because it has no randomized control trials. Therefore, this kind of study is not adequate for interventional education. It should be noted that this research shows how it can be viable and profitable to introduce a clinical-pedagogy perspective for future research on schizophrenia intervention.

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[10]   Occurred in the informal moments present in the organization of the Day Care. For example, before starting group activities or after the conclusion, during lunch… space where operators and patients share different topics including the contents of some activities that are being carried out. This is, as Socrates teaches, in order to put curiosity to the patient trying to shift his constant need for self-referentiality towards the observation of what is outside of itself.

7.   CONFLICT OF INTEREST STATEMENT

The author declared that there are no conflicts of interest in relation to the subject of this study.

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Agroterrorism as a Threat to Modern Society

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Abstract: *There is no country, no inhabited territory on the globe that is immune to terrorism. Although the roots of terrorism go back a long way, terrorism is a product of the modern age, and its causes and motives are different. Therefore, the authors identify terrorism as a world problem, because as a manifestation in one environment, it never isolates itself, but spreads very quickly to other areas. In this paper, a new, somewhat intimidating form of terrorism, better known as agroterrorism, is analyzed in detail. This paper aims to explain more precisely this new, modern form of terrorism, to make a clear distinction between the concepts of bioterrorism and agroterrorism, as well as to assess potential threats and consequences of agroterrorist attacks.*

1. INTRODUCTION

For a long time, many scientists have been working on understanding and defining the concept of terrorism. This engagement is reflected in the extensive literature on this topic. Although this "great library" reveals important aspects of terrorism, few of them speak directly about the "essence" of terrorism, i.e. what exactly is terrorism, what causes it, must terrorism be politically motivated or can it be characterized as an accidental hate attack? How important, for a phenomenon like terrorism, it is to form a psychological state of fear? What does it mean to be an innocent victim? Who is innocent and who is guilty? Is terrorism an attack exclusively on military targets or does it involve attacks on civilians and non-combatants?

Is it true that there is a parallel economic system that finances terrorism? What is terrorism under the auspices of a state? Are unemployment, inflation, mass layoffs, anarchy in the education system, and general social insecurity common causes of terrorism? Is it possible to privatize terrorism? Is it then justified to talk about human terrorism, which constantly attacks and threatens the flora and fauna? How is it that in the era of rapid information development, a term like terrorism is becoming less and less clear, although it is increasingly used? What are "cyber terrorism", "bioterrorism" and "agroterrorism"? It is extremely difficult to answer all these questions because terrorism is a very complex concept, very subjective, extremely burdened, emotionally and politically charged expression whose meaning depends primarily on the political ideology and program and even the culture to which a person belongs (Best , Nocella , 2004). Given that little attention has been paid to these "new", "modern" types of terrorism, the aim of this paper is based on the expectation that our findings will improve the fund of scientific and theoretical knowledge about a phenomenon known as agroterrorism.

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2. LITERATURE REVIEW

With the passage of time and the topic of terrorism coming into the spotlight, especially after the terrorist attacks in New York on September 11, 2001, there is an increase in the number of articles on terrorism. Since then, many scientific papers are dedicated to the analysis of this topic, but the opinion is that this number is insufficient if we, for example, take into account the potential economic impact of agroterrorism. In 2001, an epizootic of foot-and-mouth disease (FMD) broke out in the UK, and on that occasion, the fight against the disease lasted six months, costing 25 billion US dollars; if we add to this the fact that many of the infectious agents, like this one, can be obtained quite easily and require little expertise to infect animals, we come to the conclusion that agroterrorism as a way and method of committing terrorist acts is quite attractive to terrorists. Accordingly, this phenomenon should be paid with great attention and should be seriously analyzed.

Therefore, the publications that make up the relevant starting material for the research of this complex phenomenon include the works of well-known authors in the field of political and security sciences like: Simeunović, Posavac, Radosavljevic, Belojević, Best, Nocella, Dudley, Woodford, Gill, Peregrin, etc.

Terrorism as a relatively recent phenomenon has its roots. Some of the elements of the term terrorism certainly existed in the oldest political times. Political assassination, attack on the ruler and the order to achieve extreme political goals, inciting fear with violence, and the spectacularity of the attack which challenges absolute power, are well-known phenomena in human history. However, none of them, not even the sum of a few of them, is a sufficient content set to define one of these events as terrorism (Simeunović , 2010). It is most justified to conclude that certain elements, which are today considered to be constitutive elements of modern terrorism, have their manifestations that go deep into history, but modern forms of terrorism must be viewed much more broadly and specifically, and in relation to the current international security situation. It is indisputable that terrorism is one of the modern security threats and as such differs in many ways from traditional security threats, in which interstate wars are the most typical. Unlike traditional interstate wars in which opponents are known and were widely accepted rules of warfare apply, terrorism is a threat that introduces opponents to the international scene who are unknown until the moment of the attack, who do not respect any rules of civilization, thus, the fight against such an opponent is much more uncertain and difficult. Modern society is faced with an extremely high level of threats, which are directed almost daily by a growing number of terrorist organizations around the world, and that is why today great attention is paid to terrorism, especially by scientific, professional, security, and political public. On the other hand, we have a very big problem; for example, even the United Nations has not clearly defined what terrorism is. We can say that there is a so-called working pre-definition of terrorism used by the UN in the practice. A UN panel, on March 17, 2005, described terrorism as any act intended to cause death or serious bodily harm to civilians or non-combatants with the purpose of intimidating a population or compelling a government or an international organization to do or abstain from doing any act. (UN, 2005)

We must certainly emphasize another example of the conceptual uncertainty that lies in the fact that even the US Department of State, the Ministry of Defense and the FBI use totally different definitions of the term terrorism. So when we talk about terrorism, or about the definition of terrorism, we can say that consensus has not yet been reached. Definitions of terrorism are often based on the political discourse of their creators, and not on their scientific understanding of

terrorism. Therefore, when we talk about terrorism in this paper, we will also rely on one comprehensive definition which views terrorism as one multidimensional political phenomenon or a complex form of organized, individual and rarely institutionalized political violence, which is marked by frightening brutal-physical and psychological methods of political struggle, which are usually used in political and economic crises, and less often in conditions of economic and political stability of a society, systematically trying to achieve "great goals" in a way completely inappropriate to the given conditions (Simeunović, 2009).

The current security moment, after the period of world wars and bloc division of the world, is significantly more sensitive because the risk that all countries face daily is now embodied in the constant terrorist threats coming from increasingly numerous and organized groups, which are most often gathered around extremely radical political, ideological and religious goals. As we have already mentioned, different types of terrorism have seen the light of day, such as "cyber terrorism", "bioterrorism", and "ecoterrorism", and one of them is "agroterrorism", which we will discuss in more detail in this paper.

3.   DEFINING THE CONCEPT AND CHARACTERISTICS OF AGROTERRORISM

Terrorism is becoming one of the most important obstacles to modern society. Thanks to its ability to adapt quickly, terrorism is changing in its content, types, forms, and ways of action, where terrorists pursue only one inviolable goal and that is the fulfillment of their political and ideological ideas. One of these types of terrorism is certainly agroterrorism.

Agroterrorism belongs to a wider group of terrorism, which we define in the literature as ecoterrorism, more precisely to the subgroup of ecoterrorism better known as bioterrorism. So in order to fully understand what agroterrorism is, we need to precisely define what is bioterrorism, given that these two concepts are closely related. Bioterrorism refers to the intentional release of biological agents or toxins for the purpose of harming or killing humans, animals or plants with the intent to intimidate or coerce a government or civilian population to further political or social objectives (INTERPOL, 2017). The application of the mentioned biological material is most often done in populated areas and mainly in order to destroy morale as efficiently as possible by causing a large number of victims. By biological material, we mean biological agents, toxins, viruses, bacteria, fungi, etc.

If we try to make it easier to understand this concept, to further analyze bioterrorism, we can say that bioterrorism has its three manifestations, which are: genocidal - bioterrorist attacks against humans, agroterrorism - zoocidal and phytocidal, directed against domestic animals and plants and ecocidal - related to collective damage to the environment caused by bioterrorist attacks. Based on all the above, we can conclude that agroterrorism can be defined as a form of bioterrorism, which aims to disrupt or destroy the agricultural industry and/or food supply system of a population through the deliberate introduction of a plant or animal diseases, while as the ultimate goal, agroterrorism has the creation of economic losses, fear, and disruption of the internal stability of the attacked country.

4.   GOALS AND PERPETRATORS OF AGROTERRORISM

The fact is that food, water, and agriculture, in general, are the key elements of the infrastructure of every country because they provide products that are essential for life, thus, agricultural production that meets the needs of the state is a critical point of national security. If we take

this fact into account and add to it that biotoxins and infectious diseases have been sporadically weaponized throughout history (Dudley, Woodford, 2002), then nothing prevents us from thinking that terrorists can choose this type of fight to achieve their goals.

When we talk about the goals of agroterrorism, we can divide it into three groups (Gill, 2015):
- Direct - attack on plants, animals.
- Indirect - economic losses, fear, political instability - when an agro-terrorist attack is carried out on domestic animals, the attacked country must implement measures of quarantine and mass slaughter and burning of infected livestock. Everything is happening under the watchful eye of television, which, together with the huge financial loss due to the international embargo, is exactly what the terrorists want to see.
- Endangering human health - by ingesting contaminated food or if an animal pathogen is transmissible to humans by causing zoonoses.

The perpetrators of agroterrorist acts can be individuals, terrorist groups (political organizations, associations based on racial, religious, or other grounds), and individual states or military alliances. (Radosavljevic , Belojevic , 2009) Agroterrorism is a way of fighting that is undoubtedly very attractive to terrorists, primarily because infectious agents can be obtained quite easily. For example, in 1952, the Mau Mau (an insurgent organization in Kenya) killed 33 heads of cattle at a mission station using African milk bush (a local plant toxin). In 1984, the Rajneeshee cult spread salmonella in salad bars at Oregon restaurants to influence a local election. On the other hand, chemical weapons have been used more commonly against agricultural targets. For example, in 1978, the Arab Revolutionary Council poisoned Israeli oranges with mercury, injuring at least 12 people and reducing orange exports by 40%. In 1997. Israeli settlers injected a large number of pesticides into grapevines in two Palestinian villages, destroying up to 17,000 metric tons of grapes (CRS, 2007). In 2000, Al-Qaeda members tried to poison the water at the US Embassy in Rome with chemical agents; In 2003, Al-Qaeda members attempted to poison US military units by inserting ricin in food at a military base in the UK, etc.

5. PLANT AND ANIMAL AGENTS WHICH MAY BE USED FOR AGROTERRORISM PURPOSES

An example of a plant pathogen used for the purpose of an armed attack was the fungus *Puccinia graminis* which causes black rust of grain. This pathogen was used by Iraq in the fight against Iran, and it attacks all cereals and many other plants from the *Poaceae* family (Posavac, 2021). The causative agents of zoonoses known to be bred and tested as biological weapons are: *Bacillus anthracis* (anthrax), *Yersinia pestis* (bubonic plague), *Brucella abortus* (brucellosis), *Francisella tularensis* (tularemia), *Clostridium botulinum* (botulism), *Coxiella burnetii* (Q-fever), Burkholderia, Fusarium, Morbillivirus, Staphylococcus, Venezuelan Equine Encephalitis, and several hemorrhagic fever viruses (Ebola, Marburg, Lassa, Rift Valley) (Peregrin, 2002). According to recent data, animal pathogens that may be used for agroterrorism purposes are: AHS virus, ASF virus, BT virus, HC virus, FMD virus, Orthomyxovirus, influenza A virus subtype H5 and H7, LDS virus, PPR virus, Rinderpest virus, RFV virus, SGP virus, SVD virus, VS virus (Posavac, 2021).

Taking all the above facts into account, and if we add to them the last assessment of the expert who estimated that to develop a serious biological arsenal you would need about ten million dollars, a very small lab and a master's degree in chemical engineering, we can say that agroterrorism can be a serious threat with a huge impact on society (Homeland Security News Wire, 2009).

6.   AGROTERRORISM THREATS IN THE FUTURE

Because of the relatively low cost and amount of effort required in agroterrorism, some terrorist groups may direct their attacks more frequently toward agricultural production in the future. In addition, globalization, with increased importation of food, global food trading, and transportation of animals, have made modern societies more vulnerable to terrorist attacks (Keremidis, Appel, Menrath, Tomuzia, Normark, Roffey, Knutsson, 2013). A major agroterrorist attack would have substantial economic repercussions, especially when allied industries and services suppliers, transporters, distributors, and restaurant chains are taken into account. The fiscal downstream effect of a deliberate act of sabotage would be multidimensional, reverberating through other sectors of the economy and ultimately impacting the consumer (Chalk, 2003). What we can conclude from previous terrorist attacks around the world is that terrorists aim to achieve an element of surprise and often harm civilians, of course at the lowest cost to their own organization, so agriculture becomes very attractive and vulnerable, and as such, open to attacks. What we must also mention is the fact that many biological agents used in agroterrorist attacks can be relatively easily converted into a portable form, and, at the same time, there is no risk for terrorists who carry out the attack; also, in this type of terrorist action they do not need a large base, logistics or infrastructure to carry out such an attack. Also, when assessing the threat of agroterrorism, it should be assumed that the terrorist group has access to several species or types of pathogens; therefore, it is unlikely that such organizations or states directed all their knowledge, strength, and finances to develop only one type of biological weapon.

7.   CONCLUSION

Agriculture is one of the basic national interests of every state, precisely because it maintains peace and prosperity of the nation by satisfying the needs of the state for raw materials and products of plant and animal origin. Terrorism is a complex socio-political phenomenon that has experienced rapid expansion in recent years, spreading beyond the borders of nation-states. In that sense, in recent times, terrorism is taking on a new dimension and is increasingly becoming a global problem. Countries face new forms of terrorism every day and one such form of terrorism is bioterrorism, more precisely agroterrorism. Agroterrorism as a concept is little known to the general public but its effects can leave great consequences for human and animal health, the environment, and the economy of a country. In the fight against agro-terrorist attacks, the only thing we can rely on is that humans as a species have become more humane and aware of the dangers posed by biological weapons, and that, even if such conflicts occur, people and institutions will be ready to cooperate. The questions that are constantly being asked in the world of terrorism and counter-terrorism are who will use biological weapons next and when, and whether the targets of the attack will be ready to answer.

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