

Varazdin Development and Entrepreneurship Agency and University North  
in cooperation with  
GOVCOPP – Universidade de Aveiro  
Faculty of Management University of Warsaw  
Faculty of Law, Economics and Social Sciences Sale - Mohammed V University in Rabat  
Polytechnic of Medimurje in Cakovec



# Economic and Social Development

78<sup>th</sup> International Scientific Conference on Economic and Social Development

## Book of Proceedings

Editors:

Marco Andre da Silva Costa, Toni Susak, Vesna Haluga



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# THE IMPACT OF URBAN FACTORS ON NEGATIVE EDUCATIONAL OUTCOMES

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## ABSTRACT

*Investing in education has a multiple role in the development of society, and investing in secondary education gives an explicit boost to economic development. Precisely because of this, over the last decade, scientific attention has focused on finding factors that negatively affect the outcomes of the education system, as well as the relationship between the education system and these factors. Top topics of interest are drop out rates or early leavers from education. According to numerous studies, absenteeism is the most reliable indicator of early warning for dropping out of school, and it has been empirically proven that the number of days spent outside of class affects more frequent absences throughout school, resulting in most dropouts. In theoretical terms, the factors that most influence the absenteeism and dropout rates are factors at the state, regional, school, family, individual level, and especially great interest in today's research is devoted to the analysis of migration and urban factors on educational outcomes. This paper analyzes the influence of the urban factor of the distance of students' places of residence from the school in the public secondary school system of the City of Zagreb, depending on three types of school - gymnasium, vocational and art schools. This paper, based on a single database that includes 130,600 student-school pairs in a consolidated database in the period from 2012 to 2016 and the associated geocoded addresses of schools and students, determines the distances between students and schools and measures the impact of distance, gender and type schools on total absenteeism as an early predictor of potential school dropout. Univariate (ANOVA) showed that the increase in the distance of the student's place of residence from the school has a negative impact on absenteeism. The marginal impact on absenteeism is higher for vocational schools, than for grammar schools, but as well gender neutral. Undoubtedly, getting to school faster, which means faster and more organized urban transport, means lower absences and better schooling outcomes, so it is necessary to continuously improve public urban transport and student transport.*

**Keywords:** *secondary education, City of Zagreb, urban factors, student dropout rates, justified absences, unjustified absences, distance of school from students, gender, type of school*

## 1. INTRODUCTION

Investing in education in macroeconomic terms has multiple implications for the functioning of the economic system and society in general. (Smith, 1976.) It is a key factor in development, while the urban, organizational and financial characteristics of the education system are an

extremely important determinant of social mobility, inclusion and cohesion of the economy, state and society. Precisely because of this, over the last decade, scientific attention has been focused on finding the factors that negatively affect the outcomes of the education system, as well as on the relationship between the education system and these factors. Topics of greatest interest are drop-out rates or early education withdrawal as well as the relationship between students' absenteeism and educational attainment, which ultimately re-examined the factors of achieving "equality of educational prospects", as well as the role of the public and the private sector in their realization. Unjustified and justified absences from school are, according to numerous studies, the most reliable indicator of early warning for dropping out of school. It has been empirically proven that the number of days spent outside of class affects more frequent absences during the entire schooling, resulting in most cases complete withdrawal. The distance of the student's place of residence from the school is one of the most important urban factors that have an impact on school outcomes, and this correlation will be presented in detail in the continuation of the paper.

## **2. THE IMPACT OF GLOBAL AND INTERSCHOOL MIGRATIONS ON EARLY LEAVING SCHOOLS (DROPOUT RATES)**

In Australia, Canada and the United Kingdom, the share of highly educated immigrants is even higher than the share of highly educated domestic population by as much as 5.5%, 7.3% and 16.1%. On the other hand, in France, Germany and the USA, the share of immigrants with low educational attainment is significantly higher than their share in the domestic population of 14.6% & 25.5% and 22.8% (Dustmann & Glitz, 2011). Studies conducted in the U.S. and Australia suggest that black students, Hispanics, Hispanics, and Indigenous students are more likely to drop out of the education system early and generally have poorer educational outcomes. On the other hand, people of Asian / Pacific descent are less likely to achieve it than the average student of domestic citizenship. One of the most well-known theories explaining the link between migration and lower educational achievement of students is Coleman's theory of social capital (1988, 1990). Closely related to the economic concept of human and financial capital, social capital represents the connections of the child (student) with the parents and the parents with the society - friends and the community on whose support they depend. According to the theory, migration has a bad effect on educational attainment because existing social ties are broken and students are forced to build new ones. Numerous scientific studies have confirmed Coleman's thesis. (Hagan et al., 1996) They used various measurable indicators as indicators of social capital.

## **3. INFLUENCE OF ENVIRONMENTAL FACTORS ON ABSENCES AND PRINT RATES**

Over time, potential indicators of school dropouts are mainly sought among students individually, their families, schools, teachers and students. Then, at a later stage of the research, the causes of failure are sought in the broader context of the student's environment (neighborhoods, peer networks and labor markets). Attention is first focused on variables that do not "mutate" such as demographic and other risk factors that cannot be removed: gender, race, ethnicity, parental education, income, property ownership and place of residence, language spoken in the family home. The causality of the interpretation of such research is very often the understanding of early school leaving as part of a natural process thus eliminating the expediency of seeking a possible solution or reducing the problem. (e.g. Appleton, Christenson et al., 2008; Christenson et al., 2008)



### **3.1. School-level factors**

Research on the impact of school characteristics on students' educational success occupies an increasingly important place in scientific research in the discipline of economics of education and pedagogy. These studies, summarizes Marzano (2000), point out that the independent influence of school and the teaching process on student success is relatively small but significant. He lists five basic characteristics of schools and teachers that are often shown to be significant predictors of school success: 1) systematic transmission of relevant teaching content; 2) effective monitoring of student results; 3) set high expectations from students; 4) order and working atmosphere; 5) capable and cooperative leadership. For the most part, studies show that Catholic and private schools have lower dropout rates, but it is unclear whether differences arise from student characteristics, school resources and family support, or structural and organizational characteristics of schools. Student-level studies that look at the impact of urban factors on overall educational achievement primarily consider classroom equipment with technical equipment and didactic and methodological tools, the possibility of using the Internet, library accessibility and equipment, and students' personal and material equipment. This is approximated by the availability of textbooks, the assessment of the timeliness of delivery of learning materials, the number of exercises and homework and the ease of interaction with teachers. Higher levels of these indicators show an overall positive, significant relationship with higher student achievement (Frimpong, Agyeman, & Ofosu, 2016). According to Branch, Hanushek and Rivkin (2012) the impact is higher in schools with more students of lower socioeconomic status, and higher school leadership qualities lead to better decisions and ultimately better educational achievement. The characteristic of the school most often used in research (mostly due to the easy measurability of indicators) is the ratio of the number of students to teachers, ie the average number of students per teacher. This ratio is related to the size of the school. The prevailing starting assumption is that school character is significantly and negatively associated with school success when the ratio is high. In other words, with the reduction in the number of students per teacher, student success should increase as a result of greater teacher commitment to the student, or higher quality of the teaching process (Marzano 2000). This hypothesis is supported by the research of Sutton and Soderstorm (2001), in which there is a significant negative correlation between the two measures, and the ratio of students to teachers represents a significant predictor variable in the prognosis of success in both primary and secondary school. A close feature is the average class size. The size of the class is defined by the legal regulations of each country and they are generally similar among countries. The idea of reducing the number of students in the classroom has become one of the backbones of education improvement policies in many countries in recent decades. It is intuitively expected that reducing the number of students in classes should increase student performance through better class dynamics and greater individualization of teaching (Babarović et al., 2010). Research on the relationship between school size and student achievement generally suggests slightly better student performance than smaller schools compared to very large ones (Lee & Loeb, 2000). In small schools in Croatia, according to e-Matica, the average success is lower, ie dropout rates are higher, which may indicate the specifics of such schools, but also the specifics of the primary education system in Croatia (Babarović et al., 2009).

### **3.2. Family-level factors**

Different measures and methods have been used in different studies, but the results suggest a unique conclusion. Children from poor families of low socioeconomic status achieve poorer educational outcomes than students from average and well-off ones. The results of the research were made on the basis of objective measures of knowledge (tests), school grades, grade repetition, non-completion of secondary schools and a lower total number of years of schooling (eg Coleman et al. 1988; Rubin and Balow, 1979; Sutton and Soderstorm, 2001; White , 1982).

Also, the impact of early school leaving can be passed down generationally. Low-educated parents are often unable to financially provide their children with a quality education, which may result in their early drop-out from the education system (Psacharopoulos, 2007). A study conducted in Spain by the Ministry of Education reveals that parents' decisions about their own education during adolescence have a significant impact on their children's decisions, so it is actually a cause-and-effect cycle (Calero et al., 2011). According to Bežovan, Berc, Majdak (2015), other parameters such as education and occupation of parents, family income, position of the family on the social scale, family origin according to urbanity / rurality, social status of parents, and health status of parents affect the dropout.

### **3.3. Student-level factors**

Namely, there is a general consensus on a moderate to strong association between intelligence and educational achievement (Deary et al., 2007). In early studies of their association, relatively high correlations were obtained, approximately 0.70, and it was concluded that up to 50% of individual differences in school achievement can be explained by students' intellectual abilities. In addition to intelligence and personality traits, within the differential-psychological approach, there are numerous studies related to gender differences in student achievement. From the 1990s onwards, girls have been shown to outperform boys in school success in most school subjects. In addition, ethnicity, gender, immigration status, belonging to another language group, and limited cognitive abilities or some form of mental, emotional, or behavioral limitation are cited as high-risk factors associated with student dropout. Students with more serious emotional difficulties and limitations in the adoption of the material stand out as a particularly risky group. As mentioned on several occasions, poor results, whether from external performance evaluation tests or just class tests, have a large impact on the print rates present. Bežovan, Berc, Majdak (2015) show that extremely significant factors at the student level are negative grades, unjustified school hours, disturbed family relationships, student illness, and parental illness. The school success variable has often been used in scientific research into the overall effectiveness of both the education system and all its factors. Markuš and Vizek-Vidović (2005) emphasize that it implies not only the final evaluation of knowledge with grades 1-5 / A-E but also a reflection of the acquisition of skills and habits, including class attendance. According to the above, it is inevitable that a larger number of absences leads to lower school success and overall student achievement.

### **3.4. Urban factors**

More than two thirds of the EU's population lives in urban centers. Local units form a fertile ground for the development of science and technology, culture and innovation, individual and collective creativity, effective anticipation of climate change and are the initiators of change at a higher, state level. Also, the problems of unemployment, segregation and poverty are visible within local units. Hahn (2011) analyzes the aspirations faced by European cities in creating sustainable and effective public policies. Therefore, spatial segregation is the cause of inequality and has a multiple impact on the ability to reach a higher level of quality of life. Social integration strategies based on education and training are productive in situations of relative poverty, but not functional in extreme situations of poverty and segregation: The stratification of urban centers and the physically greater distance of suburban and rural centers from school, usually less populated schools, according to the report are the initiators of social exclusion, whose consequences for the overall development of society are far-reaching. Road traffic is becoming an important indicator of the success of overcoming problems and is the backbone of public policies in increasing social cohesion (as well as keeping students in school).

Research from developing countries also suggests that students in more densely populated urban areas closer to school have a higher level of participation in education (Lakin and Gasperini 2003) and, as a rule, a higher level of education, which is attributed to shorter travel times and less physical activity (Lloyd, 2005). Also, research by Lakin and Gasperini (2003), Lewis (2006) and Huisman and Smith (2009) show proximity to school as a significant determinant of girls' participation in primary and secondary school curricula because the journey to school is shorter, safer, and parents feel less fear. Furthermore, according to a study by Oselumese et al. (2016) the distance of school from the place of residence of students in Nigeria has a significant impact on absenteeism, insofar as rural students often do not arrive at school on time. In urban areas, it is possible to service equipment failures more easily, there is greater availability of various specialized educational institutions and agencies with which the school can cooperate in providing educational programs, and the concentration of competent authorities is higher, making cooperation much easier. The study, observing the characteristics of internal school influencing factors on student achievement, as the most important elements of the school atmosphere states lighting, spatial layout within classrooms and the layout of classrooms in relation to other purposes and equipment.

#### **4. RESEARCH METHODOLOGY**

Based on the unique database of the City of Zagreb, the addresses of students from the registry office of the City of Zagreb are geodetic. The addresses of secondary schools, publicly available in the databases of the City of Zagreb, are geocoded in the same way. For the purposes of empirical research, 13060 student-school data in the period from 2012 to 2016, and the corresponding geocoded addresses of schools and students were processed, and the distance between students and schools was determined. Econometric methods of univariate and multiple analysis of variance measured the impact of distance, gender and type of school on total absenteeism (justified and unjustified) as a random predictor of potential early school leaving. Analysis of variance is a statistical procedure that checks the similarity of the arithmetic means of samples for the purpose of examining affiliation to the same population (or vice versa). Analysis of the variability of results considers whether they are due to random variation or the specific impact of the independent variable(s). Therefore, for each sample, ie its categories, it is necessary to determine the interval of variation (arithmetic means of the sample around the true arithmetic mean of the population, over the standard error of the arithmetic mean) and test the constancy of the overlap zone between samples. In relation to the t-test which tests the difference between two arithmetic means, ANOVA is not limited to the number of arithmetic means to be compared. It is also possible to examine the influence of two or more independent variables in parallel and thus gain insight into the persistence of the influence of their interaction effect. Considering the number of independent variables, ie the criteria for classifying respondents into groups, several types of analysis of variance can be distinguished - one-way (1 independent), two-way (2 independent) and three-way (3 independent and so on). Univariate analysis of variance (ANOVA) calculates the difference of two or more groups - categorized independent variables with respect to one - dependent variable.

#### **5. SURVEY RESULTS**

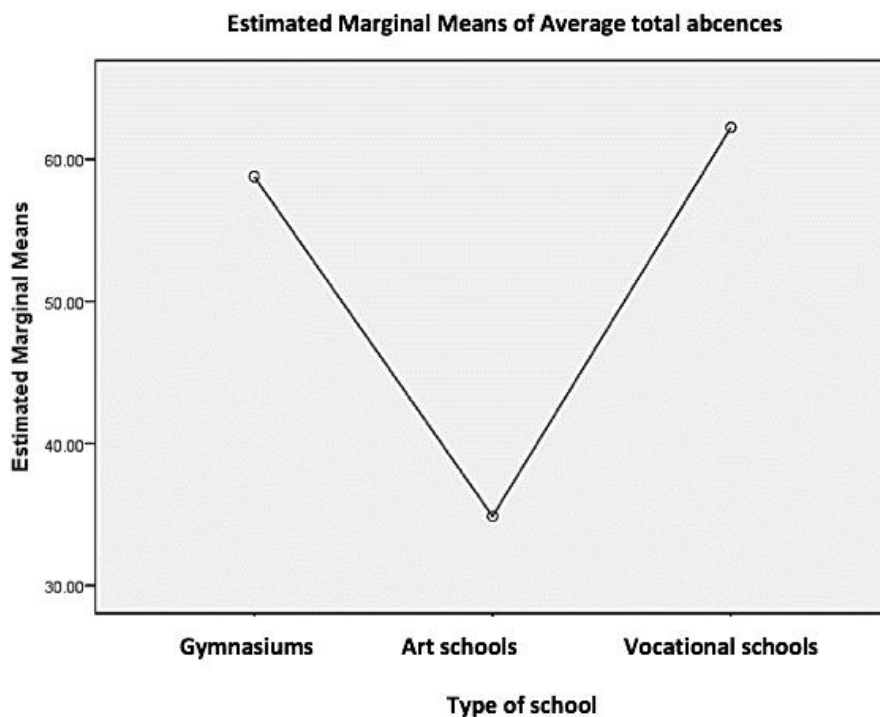
One-factor and two-factor univariate analysis of ANOVA variance were examined, and the correlation coefficients between the two variables, their significance and forecast error in regression analysis were determined. The dependent variable in the first analysis is the total average absences, while the independent is the total distance of students from the school according to predetermined distance categories: up to 1000 m, from 1001 to 5000 m, from 5001 to 10000 m, from 10,001 to 30,000 m, depending on school type (gymnasiums, vocational schools and art schools) and the gender of students (male, female).

The Tests of Between-Subjects Effects examined whether the influence of the first, second, third, and fourth factors on output, respectively, was significant, while testing the interaction hypothesis answered the question of whether there is an interaction between the four factors, which causes significant changes in the output. The results of the research conducted for the purposes of this paper are presented below. The following table and graphs give a clearer view of the results.

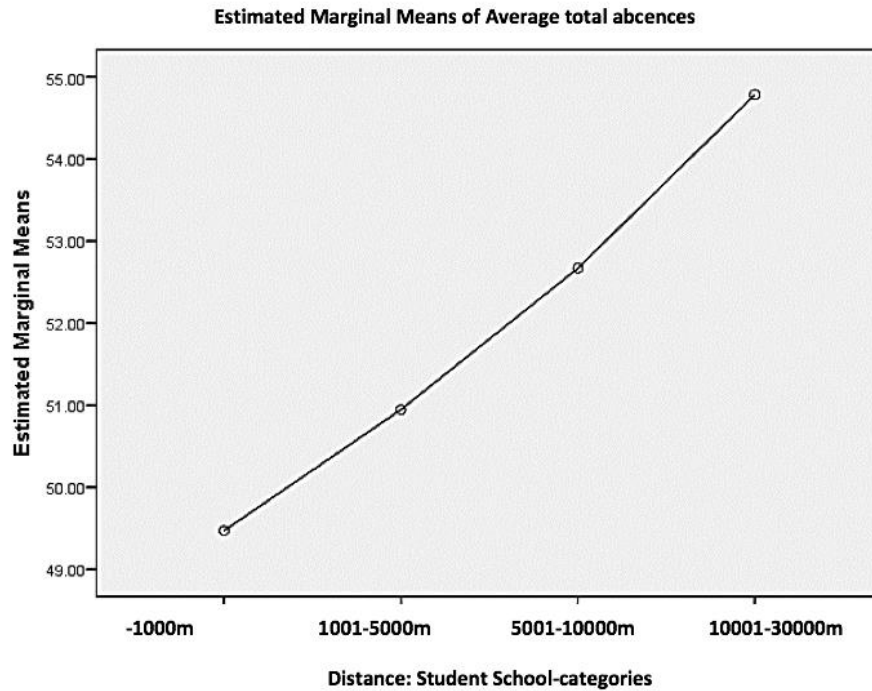
Source of variability	F value	P value
Type of school	46.536	.000
The distance of the student's residence from the school he / she attends	.993	.045
Interaction: Type of school - Distance of student's residence from the school he / she attends	7.005	.000

*Table 1: Results of variability among subjects*

The marginal influence of the mean factor of the individual factor on the dependent variable was then estimated. The same is shown in the graphs - for the marginal impact of the type of school and the distance of students' residence from the school on the marginal change in average total absences. As it is possible to notice, dance and music schools have the smallest influence on average total absences among types of school, and with distance of residence of students from school, the category of the greatest distance on total average absences has the greatest influence. While this supports the hypothesis that a greater distance of residence from school leads to higher absenteeism rates, the first observation is interesting and suggests that there are very likely other, stronger factors influencing the total absenteeism of dance and music high school students. It can be inferred that high school and vocational school students are more homogeneous groups of students.

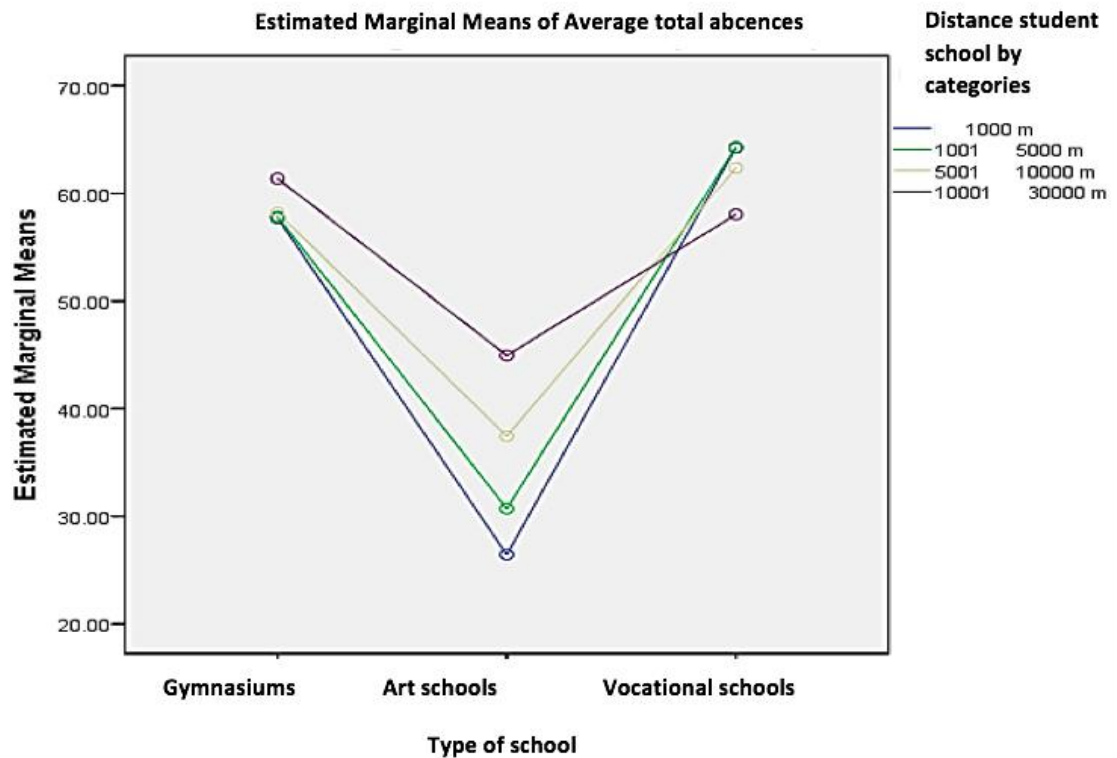


*Graph 1: Marginal impact of school type and distance of students' residence from school on the marginal change in average total absences*



*Graph 2: Influence of distance on average total absences*

The graph of the assessment of the impact of different genders on the average total absences is omitted here, due to the previously presented results according to which it is equal among the gender.



*Graph 3: Two-factor impact on absences - distances and types of school*

It is interesting to note that, contrary to expectations, the highest distance of residence of vocational school students has a smaller marginal impact on average absenteeism of students of these schools than less distance, ie the lowest impact of the smallest distance of residence of vocational school students on their average total absences. The situation is reversed with high school and dance and music school students.

## 6. CONCLUSION

According to the theory and conclusions of the reviewed research, absenteeism is a strong predictor of dropout increases to a greater extent with increasing distance of place of residence, so it is more likely that students drop out of school. The categorized distance of the place of residence (up to 1000 m, from 1001 to 5000 m, from 5001 to 10,000 m, from 10,001 to 30,000 m) to the total average absences of students in the univariate analysis of variance proved significant, as did its interaction with school types. It is important to conclude that the marginal impact of distance on gender is neutral, ie it is the same for male and female students. The lowest distance of residence of vocational school students has the highest overall impact on their average total absences. The situation is reversed with high school and dance and music school students, so a higher distance usually has a higher marginal impact on higher average student absences. Of course, we cannot look at this issue only in the context of optimizing potential students where they (however unrealistic) should assess the benefits of career choices, quality education and the cost of daily migration in the context of high school choices. The issue can be studied more widely in the context of investing and designing public transport. Namely, it may not be possible to reduce distances, but it is possible to reduce the time of daily migrations. In addition, it is interesting to observe the above in the context of optimal school locations, ie the positioning of schools in space and the impact of these locations on the outcomes of the education system for the most vulnerable groups of students. It is the same with transport infrastructure. Undoubtedly, getting to school faster, which means faster and more organized urban transport, means lower absences and better schooling outcomes, so it is necessary to continuously improve public urban transport and student transport. As the impact of the size of non-teaching infrastructure is significant in the model, it poses a challenge to public authorities to better equip schools and offer content so that students are less absent from school and as motivated as possible in the learning process. Of course, this recommendation got one of its implications through the attempt to establish one-shift teaching in the entire territory of the Republic of Croatia, which from this perspective today seems like a distant goal.

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## IMPORTANCE OF DELEGATION FUNCTION IN THE MANAGEMENT PROCESS ON THE EXAMPLE OF MANAGERS IN THE REPUBLIC OF CROATIA

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### **ABSTRACT**

*Many companies do not realize their full potential due to insufficiently clearly set and defined goals. Managers who know the tools to achieve S.M.A.R.T. goals have clear visions for the achievement of which it is necessary to properly distribute work tasks to employees that will justify the given trust. As a key skill of managers, delegating tasks carries some risks, but ensures successful business if certain rules are followed. This paper presents the primary research aimed at surveying a deliberate sample of 135 Croatian managers. The problem of the research was to determine the extent to which managers in practice recognize the importance of this function, know the necessary elements of delegation that will lead to the desired effects and how often they use the delegation process in team management. The research result confirmed that the surveyed managers in Croatia have the prerequisites for proper delegation and that they are aware of the importance of the delegation function within the overall management process.*

**Keywords:** *team performance, delegation, delegating tasks, smart goals, management functions*

### **1. INTRODUCTION**

Delegating business tasks is one of the basic functions of a manager who, in order to achieve and maintain the competitive advantage of the organization, must take care of the organization of human resources at the operational level. Operations that include planning, implementing and supporting the company's actions in order to achieve strategic goals are most often realized by managers, and the very execution of business tasks needs to be assigned to the right employees at the right time. This means that one of the tasks of a manager is to be able to assess the workload of employees and no less important to assess the competencies or knowledge, skills and abilities of their staff. A successful manager is the one who knows and can do this and when transferring business tasks to his employees is able to transfer responsibility, but also the corresponding authorities (power). The problems that come with advances in technology and increasingly complex tasks that come with demand for the fastest and most efficient solution to the satisfaction of all parties involved. If the managers are not competent for the effective division of authorities or are not aware of the importance of the delegation process, the well-being of the organization is questioned, as well as the realization of the set goals. Those managers who have the competence to effectively share authority and responsibility will have room to focus on greater goals and challenges. The process of delegation shows a need of certain trust of the superior towards the employee, which in the future can serve as a motivation for employees to solve larger tasks and challenges more independently and autonomously.



## 2. THEORY PRESENTATION

The classification of managerial functions mainly distinguishes five of them: planning, organizing, human resource management, leadership and control (Koontz & Weihrich, 1990). Regardless of the hierarchical level of their workplace, all managers use these functions, and the only difference is the amount of attention paid to a particular function. Human resources management is precisely the function of arranging and filling jobs, educating and training employees, and retaining and motivating existing quality employees (Pejić & Buntak, 2012), and the delegation process is mostly related to it, although according to Koontz and In Weihrich (1990) leadership is the most important aspect of management, and includes a number of activities, the most important of which is delegation. Most theoretician believe that in today's development of organizations, the most important part is the human potential that a certain organization has at its disposal. Vodopija (2006) defines this potential of an organization as the potential of knowledge and activities of an productive individual. According to Kuka (2011), the goal of human resource management is to realize appropriate activities within a certain organizational structure. In other words, it would involve creating certain criteria for achieving a valued individual-employee who possesses the knowledge, skills and abilities to directly influence the achievement of set goals and the success of the company. The role of managers in managing human resources includes a number of activities and tasks that are interrelated, aimed at ensuring the appropriate number and structure of employees, their knowledge and skills, motivation and behavior required to achieve current and strategic goals of the organization (Bahtijarević-Šiber, 1999). One way to invest in human resources is to select those individuals who are identified as competent according to basic criteria and give them the authority to perform certain tasks and duties. Later, the managerial control function keeps statistics on efficiency, based on which a plan for a certain period is formed. By giving authorities and responsibilities to their employees, managers free up some space for bigger challenges, while at the same time they build trust with their employees by motivating them for the next tasks and future jobs. In the last ten years, awareness of the need to invest in employees is increasing again and human resource management is in the focus of managers activities who see the delegation process as one of the most economical ways to develop employees. Delegation is a basic process for achieving organizational functionality, but also a tool that can be successfully used to increase the potential of employees by encouraging their creativity, autonomy, pride, endurance or self-realization (Gresakova & Chlebkova, 2019). The simplest definition explains delegation as guiding the process of delegating tasks to employees with the aim of influencing the efficiency, effectiveness and empowerment of employees for individual task implementation (Gresakova & Chlebkova, 2019; Al-Jammal, Al-Khasamneh & Hamadat, 2015). As a result, competitive advantage, an inventory of knowledge, increased levels of productivity and speed in the efficient completion of tasks are achieved. Everything meets the high criteria set by today's market and the success of competing companies. Quick response and coping with new requests and expectations of associates and /or partners is a basic criterion when it comes to the survival of the organization. For the previously explained reason, organizations are considering activating administrative delegation, and generally increasing the level of delegation. This leads to the promotion of functional performance and empowerment of employees without the need for senior management. It is a form of method that saves time and effort (Al-Jammal, Al-Khasamneh & Hamadat, 2015). In order for managers to successfully implement the delegation process, it is necessary to make compromises related to the sharing of authority and power. The influence of individual specialization in decision-making, knowledge, expertise and intensity of information processing on delegation was recognized. In large and complex task structures, it is necessary to have knowledge about the analysis of tasks and the distribution of decision-making rights among actors (Dobrajska, Billinger & Karim, 2015).

How risky the process of delegation can be is discussed by Schoorman et al (2016) who investigated the relationship between empowerment and trust. Many present process of delegation as a form of trust in employees, giving them the authority to perform certain actions within the organization. These authors define trust as vulnerability, and managers who have opted for vulnerability take greater risks in relationships with employees by increasing their authority. This type of risk is needed if the effect of delegation is observed at the level of the organization, managers, employees and customers. At the organizational level, competitive advantage, inventory of knowledge, increased level of productivity and speed in the efficient completion of tasks are achieved. At the managerial level, functional burdens are reduced, employee satisfaction is gained, and cooperation between managers and employees is built. At the employee level, a sense of confidence and motivation for performance excellence is activated. At the customer level, the need for delivery or provision of services that will not be delayed due to delegation authority is met (Al-Jammal, Al-Khasamneh & Hamadat, 2015). Although the impact of delegation process on employee empowerment for individual task performance has been shown, research shows that companies still do not delegate optimal decision-making powers. Also, it was observed that superiors prefer to extract information and retain it, while they retain decision-making rights for themselves. This results in a lack of effort that employees put into work (Coats & Rankin, 2017). Accordingly, the research presented below focuses on the implementation of the delegation process in Croatian organizations by examining the frequency and quality of the delegation process. In recent years, the health system in the Western world has undergone structural development caused by changes in demographics and disease patterns. The population is aging, and chronic diseases are becoming more common, making them a burden to society. To keep the health care system cost-effective, doctors are focused on reviewing the work structure without compromising the quality of care. It is a common assumption that delegating tasks from general practitioners to their staff is an appropriate procedure with a continuous increase in workload. Delegation of tasks is defined as the intentional transfer of clinical tasks from a general practitioner to another health professional or other employee with clinical training, within the medical staff. It was confirmed that in practice there are variations in the degree of delegation of authority, in which doctors delegate work and tasks to their staff. A significant correlation was found between the maximum degree of delegation of tasks and the overall satisfaction of staff with work. The analysis of general practitioners concluded that a high degree of delegation of tasks is related to the overall satisfaction of the same ones with work and job challenges, and that there is a tendency to be related to staff satisfaction with work and work environment (Riisgaard et al., 2017). Companies that have their own access control models provide important tools for the systematic specification and management of permissions in a business information system. Although there are well-known models of access control, standard models are often not suitable for handling in exceptional situations. The development of the delegation model is approached when the requirement to increase the flexibility of access management is realized (Schefer - Wenzl, Bukvova and Strembeck, 2014). The importance of delegation was also recognized by the authors Gaaloul and Proper (2014) who emphasized the importance of this process in order to resolve crisis situations. Regardless of the success of the company, crisis situations can occur and those require special methods of response and sometimes cooperation with other organizations. Coordination between independent organizations remains a challenging issue when it comes to crisis management. Strategic coordination in crisis management means many highly independent organizations that are coordinated towards a common goal within a complex network of processes. Organizations very often execute and change their plans, and they have to communicate in an "ad hoc" way. The interaction between business processes is difficult to define and plan in advance. One of the specific methods is the process of delegating tasks within the organization.

Delegation should support organizational flexibility in managing, planning and implementing emergency processes in crisis situations. However, in order for the delegation to be carried out successfully, trust needs to be achieved between collaborators and organizations. The measure and manner of using the possibilities of delegation is a reliable measure of the quality of leadership (Pusić, 2002), which is to be expected from any organization that is successful or competitive in the market. If the delegation process is modeled and used as a mechanism for managing planning of emergency situations, a quality connection of the business, information and technological environment of the company will be achieved that is otherwise difficult (Gaaloul and Proper, 2014). One of the reasons why workflow systems of one organization have been criticized as inflexible is that they lack support for the delegation process. Delegation can be introduced into the workflow system by extending the role-based access control model (RBAC). Current RBAC (role based access control) is a security mechanism for implementing access control in enterprises, allowing users to have assigned roles and privileges related to their roles and jobs (Wainer, Kumar, & Barthelmeß, 2007). Companies using the delegation process have developed a role-based access control system. Roles are used to model jobs and responsibilities within an organization. Permission to access is granted to roles according to the tasks that each role needs to perform, and is granted to human users according to their work profile (Strembeck, 2010). These roles serve as an abstract concept for delegation as well as for the assignment of duties defined through responsibilities. An entity may delegate its tasks, duties or roles to another entity, after which the entities that received the delegation act on behalf of the delegated entity or delegate (Schefer-Wenzl and Strembeck, 2014). Although many authors describe delegation as positive, conflicts that do not conform to the appropriate RBAC model can be created during design of delegation. The complexity and limitations of delegation are central to the process. Conflicts of inconsistent task allocations can occur during the process, and the most common conflicts are conflicts between creators and executors, and conflict of tasks, as well as conflicts related to the duty to perform delegated tasks. But any potential conflict is solvable, if the problem is identified. In such cases, it is important to emphasize the importance of the role of managers who are responsible for identifying potential conflicts by anticipating the steps of their employees. On the other hand, it is necessary to recognize the possibility of direct and indirect delegation on the response of employees, given that it is confirmed that direct delegation can often create confusion of persons to whom tasks are delegated (Chanif and Melinda, 2021). Knowing the qualities and shortcomings of employees, managers should make the division of labor in the best possible way, or in a way that will contribute to the success of the company and the satisfaction of customers and employees (Turkalj and Miklosević, 2017).

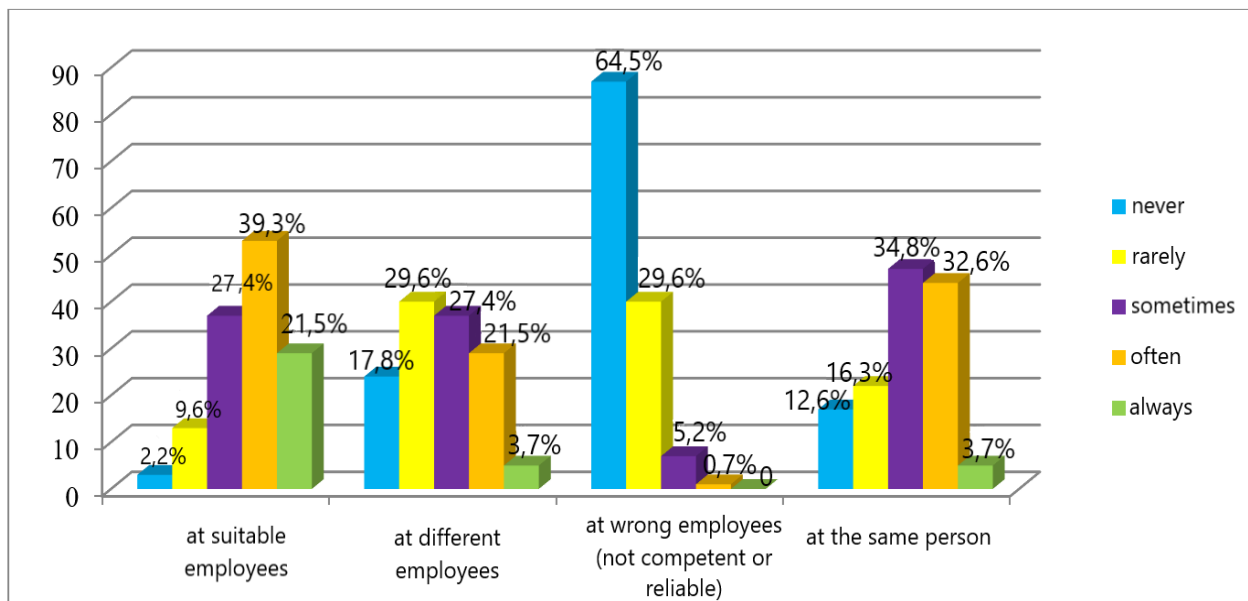
### **3. RESEARCH METHODOLOGY**

The research starts from the main hypothesis which speaks of the discrepancy between the recognized importance of the delegation process and the real situation in the organisational management of Republic of Croatia. With this hypothesis, the task of the research was to determine whether managers recognize the importance of delegation within the management process and whether they have the necessary knowledge to conduct the process of tasks delegation. The research used a deliberate sample of 135 respondents who are Croatian managers (persons in management positions). For this purpose a specially designed questionnaire is designed. The primary research used a quantitative method to obtain measurable and concrete data on the intentional sample, ie only on persons in management positions. Socio-demographic data show that 80 males (59.3%) and 55 females (40.7%) participated. The majority of respondents (36.3%) are in the group between 31 and 40 years of age, while as many as 60% have a high school or university degree.

Respondents are mostly at the highest levels of management, which includes CEOs, board members and/or company directors, and a smaller part of respondents were sector directors, managers and supervisors. A total of 57.8% of respondents have more than 10 employees in their direct personal management, and 18.5% of them directly manage more than 20 employees.

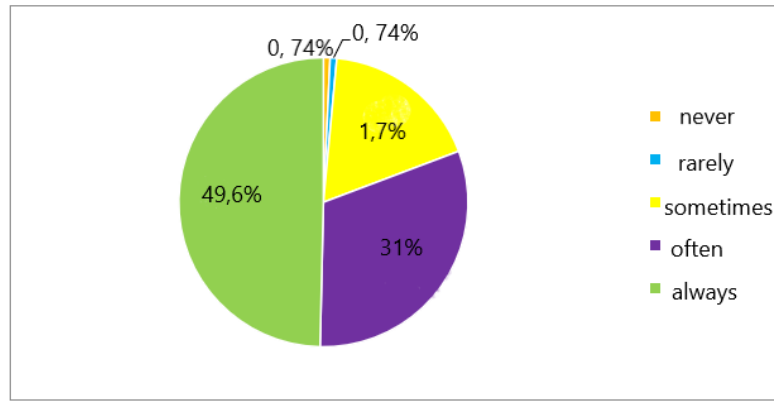
#### 4. ANALYSIS AND DISCUSSION OF RESULTS

The results show that when asked about the frequency of delegating jobs, a total of 52.6% of managers always or often delegate authorities and responsibilities while only 2.2% never delegate tasks or decision-making authority. When it comes to their own opinion on importance of delegating the tasks, there are 75.6% of respondents who believes that delegation is of great importance for the success of the company. Already the first percentage shows that a large part of managers do not carry out the delegation process at all, while many of them who do not delegate business tasks, at the same time recognize the importance of this process for the company's business. Asked specifically about the manner of delegation, 39 respondents never or rarely delegate to the same persons, while 47 respondents sometimes, and 44 respondents often choose the same persons to assign authorities and responsibilities. There are quite a high percentage of respondents (graph 1) who often (39.3%) or always (21.5%) delegate responsibilities and authorities to suitable employees, however, there are 2.2% of managers who never or 9.5% who rarely transfer the same to the suitable employees (where the meaning of suitable is competent and/or skillful) and even 64.5% of respondents who never choose the wrong person to transfer the tasks to. Managers shift the responsibilities and authorities for work tasks to different employees at the percentage of 25.2% but quite high percentage of 56.1% of respondents give the tasks to the same person.



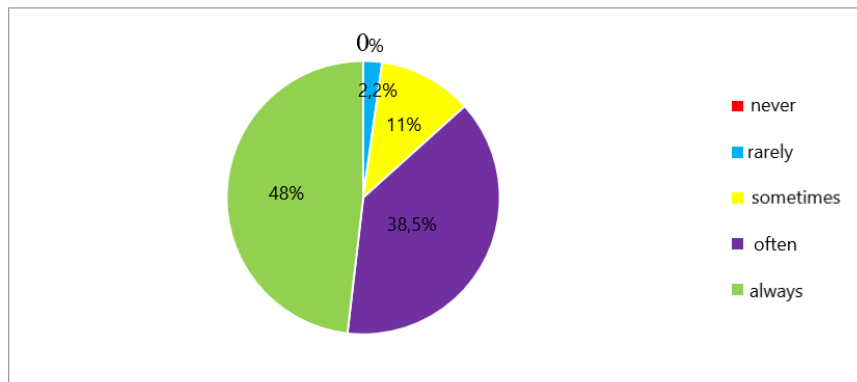
*Graph 1: Transferring autorites and responsibilities to employees  
(Source: Interpretation of research data)*

Asked about the frequency of discussion before delegating tasks (graph 2), as the activity of managers before transferring the tasks to their employees show that 80.7% of respondents talk about the nature of the task, expected results, deadlines and required time and responsibility for assigned tasks. There are 17.8% of them who do that only sometimes, 0.7% do it rarely, and another 0.7% do not discuss about the task at all.



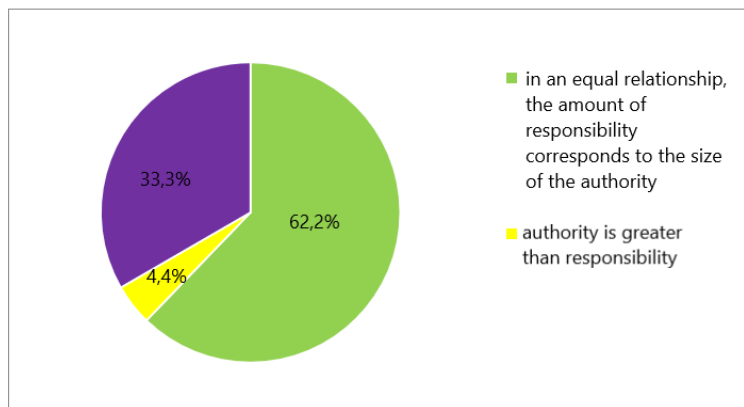
*Graph 2: Discussion about the transferred authorities and responsibilities  
(Source: Interpretation of research data)*

Monitoring the execution of the delegated task (graph 3) is done by almost all participants, except 2.2% who choose the answer "rarely". No person said that they never monitor the task execution.



*Graph 3: Monitoring the execution of the transferred tasks  
(Source: Interpretation of research data)*

The ratio of the amount of authority and responsibility in 62.2% of respondents is equal (graph 4). Some respondents (33.3%) assign more responsibilities than authorities (power), and only 4.4% assign more authority than responsibilities.



*Graph 4: The ratio of authority and responsibility  
(Source: Interpretation of research data)*

It should be noted that most respondents have never met or very rarely encounter situations where delegated tasks have not been completed. A smaller number of respondents (7.4%) pointed out that they encounter unfinished delegated tasks. If managers faced this situation, 60.7% of them would decide to help an employee, and 25.9% of them would complete the task on their own, while 5.9% of respondents would decide to forward the unfinished task to another employee.

## **5. DISCUSSION**

Most respondents among the total of 135 managers are at senior or middle management positions, which includes the president and board members, company directors, directors of various sectors, managers and supervisors. As superiors, they have an average of three to ten employees under their authority, and sometimes more. Most respondents show a high level of awareness of the importance of delegation process by saying that it is of great or medium importance for the success of a business. Managers try to conduct the process of delegating business tasks properly and it is shown by the data on the frequency of delegation, the selection of suitable ones to whom they delegate authority, and the communication process that accompanies the process of delegating the tasks. The fact confirmed by the results of the research, indicates the average level of delegation frequency, but also the rational selection of persons and fostering communication with selected employees to whom authority is delegated. The fact that the delegation process is most often carried out by the same employees shows how managers adhere to known leadership channels. There are rare situations in which managers delegate the same delegated tasks and responsibility for them to different people. But it is not known how much this affects the operation and success of the organization. Research has shown that respondents recognize the importance of the delegation process as a function of management even when they do not conduct the process regularly in their practice. Most of the respondents showed that they know the elements of the delegation process that will lead to the desired effects on the business of the organization. Although the results show a relatively large percentage of those who carry out the delegation process and those who carry it out properly, there are still managers in Croatia who do not know the process and do not implement it in their work environment within their managerial functions. The majority of respondents have a positive image of the implementation of delegation, which is confirmed by the fact that more than half of respondents give employees the same amount of authority and responsibility, which shows a high level of trust in their employees. Confidence is justified by the results shown by a relatively small percentage of 7.4% of respondents that met with unfinished tasks delegated to their employees.

## **6. CONCLUSION**

The paper presented theoretical concepts on the delegation of work tasks as one of the elements - activities within the management function. It was also determined that this is a complex concept that is crucial for the development of the organization and employees and thus for a competitive advantage for organizational business in a demanding market. Although this is a key concept, it carries a number of risks. This points out the importance of skill for delegating work tasks of the people in management positions. Risk-taking can bring positive outcomes, especially if transferring responsibilities is used as a means to increase potential of the employee. Managers have a great responsibility that will not be reduced by properly transferring responsibility to employees, but will be distributed in the executive sense and enable the achievement of the desired organizational goal that otherwise could not be achieved. The conducted research showed that Croatian managers have necessary competencies for delegation process and their awareness of the importance of the process itself as well as the proper distribution of responsibilities and authorities.

It can be concluded that delegation as a function of management is important content of educational programs for future managers and that it is necessary to teach staff about the process itself, elimination of potential risks and the need for control the process. The results of the research show a positive present status, but it would be advisable to conduct research on employees and correlate the attitudes (and experiences) of respondents-managers with the attitudes (and experiences) of their employees and determine whether there are discrepancies.

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# THE IDENTIFICATION OF ACTIONS FOR THE DEVELOPMENT OF THE KNOWLEDGE, SKILLS AND ATTITUDES OF THE PROFESSIONALS IN THE INFORMATION SYSTEMS AREA

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## ABSTRACT

*Since the end of the last century, the high rate of innovations and the constant changes in the entrepreneurial environment have required frequent updating and qualification of the professionals who work in the Information Systems area (IS), so they can absorb the organizational demands with efficacy and efficiency, guaranteeing their employment, as well as the survival of their organizations. In the face of this context, the purpose of this research study is to identify actions for the development of the knowledge, skills, and attitudes of the professionals in the IS area in view of constant technological innovations. Therefore, bibliographic research on the literature of the addressed theme and field research with the application of a questionnaire to 135 IS experts, who were grouped into generations, was performed. As a result, it is possible to observe variable perceptions of each generation, including the actions that can be taken for the constant updating of the studied professionals, with emphasis on self-learning; the familiarization with recent innovations, be it through investment from the company or through the personal initiative of the professionals; and also the search for qualification, specialization, and knowledge. As a contribution, this research study intends to show the importance of professional updating in the face of constant innovations of the organizations, as well as to be used to assist with the guidance of future policies toward the formation and qualification of such professionals.*

**Keywords:** *Innovation, Information Technology, Information Systems*

## 1. INTRODUCTION

Since the end of the last century, the constant innovations in the Information and Communications Technology (ITC) area have required that Information Systems professionals invest in continued qualification, so they can keep up with the organizational demands, therefore guaranteeing their survival in the labor market and in the companies where they work. Danish *et al.* (2019) assert that the companies in the ITC area: “are prone to changes because most of the innovation and creativity has been observed in these firms.” Consequently, the IS professional who can improve knowledge, skills and attitudes is able to achieve the quality and productivity goals established by the organizations, as well as to guarantee the employment in a labor market that imposes countless challenges on the survival of the companies, in the face

of the economic instability and growing innovation, which is something extremely necessary when providing products and services to the consumer market (Ferreira, 2003), what is also noticeable in other professional areas (Kanjapathy and Ramakrishnan, 2018). With time, it is possible to notice that the IS professionals have several updating methods available, however, the choice will depend on the educational background, labor market experience, and mainly on the personal needs that comprise the availability of time and resources, when the professionals are responsible for their own upgrading (Quintão *et al.* (2001). Besides, of course, their natural competencies, which must be combined with their knowledge (Getaruelas, 2019). Such professionals face the daily challenge of living with process innovations, which are defined by Rose *et al.* (2016) as all the relevant improvements in design techniques, team organization and managerial processes, and assist to influence the development of products and services. However, in practice, it is observable that professionals overwhelmed with work, committed to meetings that, besides entailing new demands, postpone accomplishing the duties that do not fit in the working hours (Predebon, 2010). Such work overload, associated with the lack of time to attend qualification and updating courses, as well as with the low financial investment of the companies to provide training and refresher courses, demotivate the professionals to achieve professional qualifications, even on their own initiative, once they consider it is not worth channeling efforts, time and financial resources into perfecting knowledge to improve their professional practices to ensure better quality and productivity. Within this context, the purpose of this research study is to identify actions for the development of the knowledge, skills, and attitudes of the professionals in the IS area in view of constant technological innovations.

## **2. THEORETICAL FOUNDATION**

### **2.1. Information Systems**

The expression Information Systems (IS), according to Turban *et al.* (2010), concerns the system responsible for the collection, processing, storage, analysis and dissemination of the information of an organization with a specific purpose. As every system includes inputs, like data and instructions, as well as outputs, such as reports and calculation analyses, in other words, they provide information that assist with the decision-making process. For Laudon and Laudon (2014), Information Systems are an organizational and administrative solution that uses Information Technology to identify and exceed the improvement points present in the organizational environment. In this sense, O'Brien (2004, p.6), supports a basic conceptual structure, which was adapted to represent the main IS components: people (both, IS users and experts); hardware (computers, machines and media); software (programs, guidebooks and operational procedures); data (databases and data warehouses); and network (communication media and network support). The term Information Technology, as stated by Turban *et al.* (2010), regards the technological side of an IS, a type of subsystem of an information system, "including hardware, software, databases, networks, the internet and other electronic devices", which assists with and facilitates the search for information. According to Souza (2004), IT is a component of IS that includes its functions and comprises computers of several capacities and sizes, as well as the operational system that supports them, the programming languages, the office automation applications, the data storage technologies, the data communication technologies, the devices related to the collection and distribution of information in a digital manner. It is worth highlighting that innovation facilitates the development of new values for clients, simplifies internal development processes and opens market spaces that have not been dominated by larger competitors (Rose *et al.* 2016). And as a result of its study, it is possible to conclude that knowledge, innovation management and innovation in the performance process of the team are the most significant innovation impellers within the organizations. According to Wu and Chen (2014), the innovation of Information Systems allows conditions for the creation of exclusive and valuable resources, which enable the performance of the company to

stand out. The technological advantage and the competitive intensity are performance indicators used as a comparative basis, which encourage the diffusion of IT innovation in the organizations.

## **2.2. Knowledge, Skills and Attitudes of the IS Professionals**

According to De Castro and De Sá (2002), the Information Technology area has not been addressed under the prism of technology and organization only, since human resources constitute a fundamental component. Therefore, the IS professionals are essential as change agents in the organizations. Furthermore, as Fleury and Fleury (2004) state, the current labor market requires the adoption of a new model of work organization and production management based on competence and the individual results of the professionals, being the alterations in the most diverse organizational aspects a serious consequence, even in the aspects that refer to the social relationships within the company, and the adjustments to innovations. According to Tartari *et al.* (2014), some authors such as Vila *et al.* (2012), Teza *et al.* (2012), highlight the need of educational actions for the development of innovative competences. By considering that the emphasis is placed on abilities and attitudes, the challenge of forming active Information Systems professionals pertains to the promotion of actions for the development of these dimensions of professional competencies. Based on this understanding, the philosophy created for professional assessment named KAA – Knowledge, Ability and Attitude, which has been used by the organizations to describe the profile of the employees that they intend to hire or keep, stands out. Such philosophy was used in this research study with the IS professionals, according to Rabaglio (2001). On the other hand, Luchesi (2012) understands that competence is composed by real knowledge, abilities, experiences, judgment of values, and even social relationships. It is the link between knowledge and strategy, but it is not possible to copy it, just to transfer it through practice. Along this line, according to Deluiz (2001), the appreciation of education, mobility and individual monitoring of the career become new evaluation criteria for hiring workers, in order to identify professionals with potential for development, flexibility to deal with adversity and awareness of organizational demands. They are fundamental competencies for the ones who work with technology. According to Rose *et al.* (2016), the IS professional needs to deploy an array of innovation tools and techniques, as well as of situational knowledge regarding when to use them, for an efficient development of his or her activities. Another important aspect is the capacity and willingness of the professional to share knowledge. Therefore, Arazy *et al.* (2016) advocate that encouraging the collaborators of an organization to share knowledge is one of the main challenges of innovation and of the sharing of mediate knowledge of technology, without forgetting about the different age ranges that these organizations include. In this regard, Zemke (2008) and Fachin (2011) observed that there are five generations working together in organizational environments. They differ in beliefs, values and priorities, based on when they appeared.

## **3. METHODOLOGY**

This study initially performed bibliographic research on books and scientific articles, without establishing a deadline for the researched sources, thus enabling the analysis of the development of the theme over time. According to Gil (2010), the type of research enables the contact of the researcher with a wider array of phenomena regarding the analyzed theme than the one that could be performed directly. In the literature review, the researchers aimed at the theoretical foundation of Information Systems and the knowledge, skills and attitudes of the professionals in this area in the face of the constant technological innovations. The literature review enabled field research with experts of the Information Systems (IS) area, in order to map the perception of these professionals regarding the facts that may influence their updating/qualification in the face of the constant need for innovation required by the labor market and the organizational

world, emphasizing that all research contributes to the improvement of any profession (Sheik *et al.*, 2020). The research used a questionnaire with 12 questions, 9 of them being closed answer questions, with two of them enabling more than one option as answer, and one open answer question. Before the effective application of the questionnaire, a pre-test with 5 IS professionals in the IT area was performed, in order to validate it. After the validation, the researchers informed the professionals in the IS area about the questionnaire link over Facebook and LinkedIn groups, and obtained the answer from 135 respondents. The purpose of the questionnaire was to highlight the major difficulties regarding innovation faced by the professionals of IS. It is worth highlighting that the 135 respondents were grouped in generations, considering their respective years of birth, by following the characteristics of each generation, according to Zemke (2008).

#### 4. ANALYSIS AND DISCUSSION OF THE RESULTS

The first obtained result (**question 1**) refers to the profile of the 135 interviewed professionals who were divided into generations, according to the characteristics. The researches verified that 23% of the respondents belong to Generations Z; 13% to Baby Boomers; 1% to Traditional; and 63% of the respondents belong to Generations X (32%) and Y (31%), demonstrating that the professionals who work in IT are adults, predominantly in the ages between 30 and 50 years old. Regarding the time working in the Information Systems area (**question 2**), it can be verified that more than 50% of the interviewees have more than 10 years of experience in the area, characterizing a professional who is experience and an expert in the are. In the sample, there are also beginners in the career, 11.9% with less than 3 years. **Question 3** asks about the genre of the respondents, and it is observable that the universe of the interviewed IT professionals is predominantly formed by men, it means, 76.3%, being 23.7% formed by women. According to Moura Jr. and Helal (2014), the studies by Trauth *et al.* (2012) and Clayton *et al.* (2012) justify that the routine of the IT professionals is difficult to reconcile with the role of mother, wife and homemaker. Yet, in the study by Olinto (2011), the author defends that the technology area is still considered little attractive by women. **Question 4**, observe that 88.1% of the respondents live in the Southeast region of Brazil, since the main companies in the technology industry are located in Rio de Janeiro and São Paulo, because they are areas of huge economic, academic and industrial concentration, which have the infrastructure that is favorable to such activities. Regarding education, the highest percentage of the interviewed professionals (57%) have an undergraduate degree in the IT area, and 40.1% have a graduate degree or specialization, (**question 5**). Such data converge with the conception of Mckillip and Cox (1988) and Ferreira (2003), who defend the importance to always seek qualification and refresher courses, so that the professional can guarantee his or her continuity in the labor market. **Question 6** estates that, regarding the position of the respondent professionals, 41.5% are system analysts. However, it can be verified that 25.9% hold a management position, as managers or area coordinators. It is noticeable in **question 7**, that a 54.8% rate of the professionals have been developing their activities in the current company for less than 10 years. According to Moura Jr. and Hellal (2014), the IT professional always seeks new opportunities for his or her career. Like that, some authors such as Bernthal and Wellings (2001), and Pipoli and Fuchs (2011), defend that the professionals working in the technology area, the younger ones mainly, offer a high risk of turnover. According to **question 8**, 82.2% of the 135 interviewed professionals still perform their functions in companies of the technology industry, the ones who answered that the companies where they work are innovative in their processes, products and organizations. The remaining 17.8% do not work in companies of the technology industry. Only 72.8% of the 82.2% of professionals consider that information system companies linked to innovation have a higher organizational development level because they are directly engaged in innovation (**question 9**).

The researchers presented a question about the impacts of innovation in day-to-day work to the interviewed professionals, regarding the need for investments in professional qualification (**question 10**), enabling the possibility for the respondent to choose more than one alternative as answer. Table 1 below shows the way the IS professionals have been updating their professional skills in the last two years.

How have you been updating your professional skills in the last two years?						Total
Professional Updating per Generation	Generation Z	Generation Y	Generation X	Baby Boomers	Traditional	
Self-learning	24	34	37	13	1	109
Exchange of experiences/knowledge with professionals in the area	28	29	38	10	1	106
Training courses provided by the companies where the professionals work	14	22	28	9	1	74
Remote training courses	17	21	23	5	1	67
Sequential courses	10	13	14	8		45
Training courses given by institutions/companies that provide short courses and/or official suppliers	9	11	10	4		34
Graduation/Master's/MBA courses	7	7	11	2		27
Others	1	1		1		3
I have not updated my professionals skills						0
Total	110	138	161	52	4	

*Table 1: Professional Updating  
(Source: Own Elaboration (2020))*

As presented in Table 1, the three most used ways to update professional skills are self-learning, the exchange of experiences/knowledge with professionals who work in the area, and also the training courses provided by the companies where the professionals work. And the least used ways are: graduation/master's/MBA courses, the training courses given by institutions/companies that provide short courses and/or courses from official suppliers, as well as sequential courses. Regarding the ways to update professional skills, there are several possibilities, according to Quintão *et al.* (2001). This research study observed that the interviewed professionals acknowledged that the main way to improve their knowledge skills is through self-learning and the exchange of information with professionals who work in the area. It reveals that updating is an action that basically results from the initiative of the professional who tries to be always prepared for the demands of the labor market, in order to guarantee his or her employment. Table 2 presents the main barriers faced by the IS professionals when keeping up with constant innovations (**question 11**), enabling the possibility for the respondent to choose more than one alternative as answer.

*Table following on the next page*

What barriers are faced by the professionals in the Information Systems area when keeping up with innovation in the organizations?						Total
Barriers to innovation	Generation Z	Generation Y	Generation X	Baby Boomers	Traditional	
Lack of time due to daily tasks.	18	30	29	8	1	86
Lack of investment by part of the company	11	13	17	2		43
Lack of self-investment	10	12	17	4		43
Lack of appreciation by the company	9	12	9	3		33
I cannot keep up with the fast technological evolution	4	5	11	5		25
Lack of demand for his/her tasks	2	7	10	3	1	23
Lack of qualification	5	6	6	2		19
Fear of taking risks	4	8	6			18
Resistance to changes by part of management	4	5	7	2		18
Lack of infrastructure	3	6	5	2		16
Lack of agility	6	3	5	2		16
Inflexibility by the organization toward innovation	7	5	4			16
I do not have barriers	4	3	3	4		14
Fear of mistakes	3	4	4			11
Lack of skills	1	4	4	1		10
Self-resistance to change		2	8			10
Lack of creativity	3	1	3			7
Others	1		2	1		4
Total	95	126	150	39	2	

*Table 2: Barriers to innovation  
(Source: Own Elaboration (2020))*

As presented in Table 2, the three major barriers are, respectively, the lack of time due to daily tasks, the lack of financial investment by part of the company, as well as the lack of financial investment by the own professional. On the other hand, the three minor barriers are the lack of creativity, the lack of skills and resistance to changes by the own professional. The existence of factors that hamper or even influence innovation in the labor market is undeniable. Through this research study, it is possible to verify that, in convergence with Predebon (2010), the motives are: the lack of time for dedication to updating and qualification because of excessive work hours, as well as the lack of financial resources to invest in training courses, seminars and workshops, justified by the world crisis which has overtaken not only natural people, but also legal entities. Table 3 presents the main actions that should be taken by the IS professionals (question 12).

*Table following on the next page*

Which actions can be taken by the professionals in the Information Systems (IS) area in the face of the impacts of the constant IT innovations?						Total
Consolidated Proposed Actions	Generation Z	Generation Y	Generation	Baby Boomers	Traditional	
Seeking professional/technological/skill updating	20	41	38	12	1	112
General updating	13	21	23	8	1	66
Study/self-learning	6	12	4	3		25
Exchange of knowledge		2	6			8
Taking up training courses	1	4	1	1		7
Participating in Workshops, Hacktons, Meetups		2	2			4
Achieving Upskilling			2			2
Keeping up with innovation	5	7	13	1		26
Seeking qualification/specialization/ Knowledge	7	6	5	3		21
Keeping up with/knowing the market	4	7	6			17
Leaving comfort zone/being open to changes	3	7	5			15
Company implementing/encouraging innovation/updating			5	1		6
Requiring new technologies/innovation/changes in the company by part of the employees	2	2	2			6
Dedication in the free time/managing time		3	1			4
Keeping up with technology channels/blogs		2				2
Agility in the implementation, and in a short time		1	1			2
Communication		1	1			2
Developing a culture of risk management to innovate		1	1			2
Collaboration			1			1
Effort appreciated by the company		1				1
Being multidisciplinary	1					1
Networking		1				1
Being flexible		1				1
Having confidence to innovate				1		1
Total	62	122	117	30	2	

*Table 3: Proposed Actions*  
*(Source: Own Elaboration (2020))*

Overall, it is possible to verify that the interviewed employees consider the following actions to be the most relevant ones: seeking professional updating in the most diverse aspects, with emphasis on self-learning, keeping up with arising innovations, as well as seeking qualification, specialization and knowledge. When analyzing the proposed actions per generation, it is noticeable that seeking professional updating, as well as keeping up with innovation are relevant actions to the respondents from Generation X; Generations Y and Z value the importance of professional qualification, besides professional updating.

## 5. FINAL CONSIDERATIONS

Through a questionnaire answered virtually by 135 professionals in the area, this research study obtained some results related to the perception of such professionals regarding factors that may influence their updating/qualification in the face of the constant need for innovation required by the labor market and the organizational world. Therefore, the professionals emphasized that the search for information impacts their careers by keeping them updated in the labor market, since they always need to seek professional updating, whether through self-learning or even through the exchange of information and knowledge with other professionals, because they need to conciliate the search with their daily tasks. It is possible to observe differences in the updating and improvement strategies of the professionals, according to the technological generation they belong to, since each generation has its peculiarities and a viewpoint of the world in relation to beliefs, values and priorities, in the professional ambit, as well as in the personal one, regarding dedication and commitment to work, to the focus on quality of life, and even to the respect towards the organizational hierarchy. The professionals that belong to the Generations X and Y are the ones who try harder to improve professional background, probably because they are in the age ranges formed by more mature people, who are concerned about the results of the company, but who need to keep up with the tendencies and innovations of the technology area. It is undeniable that the requirement for quality and productivity by the companies due to the instability of the market has determined the need for the continued education, in order to assure the qualification of the workers, based on professional competences. Therefore, the ones who work with technology must enhance their knowledge, skills and attitudes to guarantee the differential and the competitive advantages of their organizations, in order to continue updated and guarantee their employment. As a suggestion for future works and for a higher level of reliability in this study, the researchers propose a research study focused on a comparative between the perceptions of the managers and employees in the information systems area, regarding the challenges and needs for innovation and creativity in their daily tasks in the organization.

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# IMPLEMENTATION PROCESSES OF QUALITY MULTI MODELS: ISO 9001, CMMI-DEV ML3, AND MPT.BR ML3 IN SMALL AND MEDIUM-SIZED ENTERPRISES (SMES) OF INFORMATION TECHNOLOGY

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## ABSTRACT

*The implementation of quality management models is a complex process, which becomes a challenge for small and medium-sized enterprises (SMEs) of Information Technology (IT) that provide software development services. Adopting quality management models can be part of the strategy of those SMEs, making those organizations competitive and more resilient in such a competitive globalized market. These quality management models are, in general, descriptive, showing only what to do instead of prescriptive, detailing how to do it. It involves high risks, time waste, high costs, and plenty of bureaucracy as a project. Therefore, this article proposes processes and procedures for integrating quality multi-models, specifically the ISO 9001 (Quality management systems - Requirements), the CMMI-DEV ML3 (Capability Maturity Model Integration for Development Maturity Level 3), and the MPT.Br ML3 (Brazilian Software Process Improvement Maturity Level 3) to IT SMEs. To accomplish this objective, methodological procedures were used, such as exploratory literature research, research-action, focus group interviews, individual interviews, and documentation surveys in an IT medium-sized enterprise. By establishing those implementations with details of how to do and indicating and pointing out guidelines, mandatory activities, documents that must execute, and general orientations, it is possible to obtain the seal and the official certifications for the IT SMEs. In addition, due to the absence of references on how to implement in a more integrated manner the elected standards to establish this improvement on the software development process and quality management for IT SMEs, this article contributes to the usage of these processes by software development enterprises and by the Academy.*

**Keywords:** CMMI-DEV v2.0, Implementation, Integrating quality models, ISO 9001, Small and medium-sized companies

## 1. INTRODUCTION

The current scenario, specifically for small and medium-sized companies (SMEs) that provide technology services, is quite complex. There are several factors such as continuous innovation, constant changes in technology, high customer demand, and, with a globalized market, competitiveness becomes increasingly fierce for these companies.

In this scenario of great complexity and competitiveness, Aires e Salgado (2017, p. 1) present that “quality is essential for the survival of organizations in the face of the accelerated evolution of technologies and demands of the globalized world.” They also add that the understanding and knowledge of business processes enable improvement opportunities for organizations. Almomani *et al.* (2014, p. 1) state that small and medium-sized software companies (SMEs) play a crucial role in the world's economy and also comment that “several studies have shown that these companies use 'ad-hoc' methods to develop software and suffer from a lack of knowledge and resources to implement software process improvement”. Lopes (2014) states that for companies to meet customers' growing needs and have competitive advantages, they must adopt a quality management policy in their strategy to guarantee the satisfaction of customers and their stakeholders. As stated by Albuquerque and Oliveira (2019, p. 110) “the most appropriate way to obtain such competitiveness is the quality search, through the adoption of techniques, methodologies, and management tools, where all actions are previously planned and discussed.” In addition to the search for process improvement cited by several authors, Ayyagari and e Atoum (2019, p. 445) highlight that “with the advancement of technology and increasing customer requirements, software companies seek to reduce costs and increase productivity by adopting standards and best practices.” To ensure improving the performance of the organization's processes, the literature presents several standards, practices, methods, and tools at the national and international levels. There are a variety of models, standards, and methodologies that enable a better quality of an organization's products and, or services available to support different segments of the Information Technology (IT) industry. To Dahar and Roudies (2019a) companies are led to adopt various standards and references of good practices in the management of their processes and, as a result, achieve a better quality of their products and services. As Ayyagari and Atoum (2019) presented, some researchers highlight adopting a model that describes Capability Maturity Model Integration for Development (CMMI-DEV). This software process improvement model improves productivity reduces the time and cost of executing software development projects. Other researchers like Dahar and Roudies (2019a) present that the ISO 9001, CMMI, and other standard models aim at customer satisfaction by providing a quality product, process, or service, respectively, creating a mutual trust. To support this work, specifically in the context of IT SMEs, which aim to maintain the quality excellence of products and services and stand out in the competitive market, we seek to present proposals for processes and procedures for integrated implementation of multi-models, based on Quality Management standards such as ISO 9001, CMMI-DEV and MPT.Br, which comprehensively supports IT organizations.

## **2. QUALITY MODELS**

Sousa (2011, p. 40) presented that since the 1980s, it has been common to define quality as "assuring or exceeding customer expectations." Borges (2015, p. 34) states that "quality standards are references for evaluating the ability to satisfy customer needs, both at the time of purchase and during use, at the lowest possible cost, reducing losses". Almomani *et al.* (2014, p. 1) comment that “several studies have shown that [SMEs] use “ad-hoc” methods to develop software and suffer from a lack of knowledge and resources to implement software process improvement.” “The adoption of a quality management system is a strategic decision for an organization that can help improve its overall performance and provide a solid foundation for sustainable development initiatives.” (ABNT, 2015, p. 7). It is understood that there is a need to use quality standards in IT SMEs. The following subchapters present applicable models that are used in this work.

## **2.1. ISO 9001:2015 - Quality management systems**

ISO, International Organization for Standardization, is the International Organization for Standardization that establishes a portfolio of standards with an international scope. As presented by Baldassarre et al. (2010), in the context of this work, ISO provides requirements for the elaboration of the Quality Management System (QMS). This work is based on the ISO 9001:2015 standard, Quality Management Systems - Requirements, which is the standard that specifies the requirements and requirements for the Quality Management System, identified as “ISO 9001”, revised in 2015. (Fonseca et al., 2019, p. 1). As stated in the standard itself, the requirements are “generic and applicable to all organizations, regardless of their type, size and the product and service they provide.” (ABNT, 2015, p. 1). Another highlight in this review is the need for the organization to focus on the “risk and opportunity mentality” to put preventive controls into practice, minimizing adverse effects and maximizing the use of opportunities that arise. (ABNT, 2015). ISO 9001 provides requirements for an organization and “promotes the adoption of the process approach in developing, implementing and improving the effectiveness of a quality management system, to increase customer satisfaction by meeting customer requirements” (ABNT, 2015, p. viii). Having the ISO 9001 requirements in the organization reflects its employees and the market that it cares about its processes, continuous improvement, and quality management for its customers (Dahar and Roudies, 2019b and ABNT, 2015). The QMS requirements are organized in the following structure: Organization and its context, Leadership, Planning, Support, Operations, Performance evaluation and Improvement to ensure quality and encourage continuous improvement of the quality system. ISO standards are based on the well-known and widely accepted PDCA, Plan, Do, Check, Act cycle to achieve continuous improvement. Each cycle is an opportunity to increase the efficiency of the process, keeping the company in the process of constant improvement. (Fonseca et al., 2019). The standard requirements are associated with each phase of the cycle to achieve the effectiveness of the process. Both ISO 9001 and CMMI are important models with wide acceptance for evaluating and improving software processes. (Macalister, 2012). As presented by the researchers Ijaz et al. (2016) the combined adoption of ISO 9001 and CMMI can bring synergy and improve the quality of software processes. ISO promotes a continuous model for assessing process capability.

## **2.2. Capability maturity model integration development version 2.0 (CMMI-DEV v2.0)**

Capability Maturity Model Integration (CMMI) is an integrated capability and maturity model known worldwide that contains “an integrated set of best practices that seek to support organizations in improving the performance of their key processes” (Rocha et al., 2018, p. 3). This is the most adopted performance improvement standard worldwide, and its use has grown steadily in recent years. (ISACA, 2020) and (Henriquez et al., 2022). Capability Maturity Model Integration Development (CMMI-DEV) is a specific standard for Software Development, containing guidelines, processes, and requirements for companies that provide this type of service. The new version 2.0 of CMMI was released in 2018 (CMMI Institute, 2018) with significant restructuring, new rules, requirements, and requirements for implementation. At the end of 2019, the adoption of this version became mandatory, discontinuing the previous version 1.3. In the last report published on 21 May 2021 by ISACA, the body responsible for the management and guidelines of the model, this certificate is present in more than 100 countries, in more than 10,000 organizations, and in more than 20 different industries, being IT in the sixth position. In 2021 the implementation of this model had a development velocity increased up to 38%, and CMMI v2.0 improved productivity up to 54%, improved product quality by an average of 70%, reduced rework by up to 60%, of the achieved objectives report to quality and productivity 72% (ISACA, 2021). There are few bibliographic references for the current model.

In research carried out on the ISACA page on 08/01/2020 (CMMI Institute, 2020a) and (CMMI Institute, 2020b), it observes that of the total of 8,345 records issued and in force for the CMMI-DEV, only 96 assessments were issued based on the new version 2.0. For this reason, knowing the latest version of the CMMI becomes important for greater model adoption. The CMMI-DEV 2.0 organizes into four categories: doing, managing, enabling, and improving. These categories are “groups or logical views related to capability areas that address common problems encountered by organizations when developing and delivering solutions.” (Rocha et al., 2018, p. 3). They are distributed in nine capacity areas: Planning & Managing Work (PMW), Managing Business Resilience (MBR), Managing the Workforce (MWF), Engineering & Developing Products (EDP), Ensuring Quality (ENQ), Selecting & Managing Suppliers (SMS), Supporting Implementation (SI), Improving Performance (IMP) and Sustaining Habit & Persistence (SHP). A capability area is made up of a set of practice areas. A collection of practice areas contains the practices that are the model's requirements and recommendations for each maturity level. The model is composed of 21 practical areas: Estimating (EST), Monitoring and Control (MC), Planning (PLAN), Risk & Opportunity Management (RSK), Organizational Training (OT), Product Integration (PI), Technical Solution (TS), Requirements Development and Management (RDM), Process Quality Assurance (PQA), Peer Review (PR), Verification and Validation (VV), Supplier Agreement Management (SAM), Supplier Source Selection (SSS), Causal Analysis and Resolution (CAR), Decision Analysis and Resolution (DAR), Configuration Management (CM), Process Asset Development (PAD), Process Management (PCM), Managing Performance and Measurement (MPM), Governance (GOV) and Implementation Infrastructure (II) (CMMI Institute, 2018). According to the approach and practical areas implemented, the organization can classify into maturity levels (ML). These maturity levels are stages of evolution and service to the model and serve to level the positioning of companies. CMMI-DEV 2.0 has five maturity levels, they are ML1 (initial), ML2 (managed), ML3 (Defined), ML4 (Quantitatively Managed) and ML5 (Optimizing) (CMMI Institute, 2018, p. 26). In surveys carried out on the CMMI Institute website on 08/01/2020, of the total approved assessments, approximately 82% of assessments are for ML3. (CMMI Institute, 2018). The CMMI helps as a reference for other models, as it incorporates several practices, making it increasingly complete and consistent, serving as the basis for the test process improvement model, MPT.Br (SOFTEX, 2015, p. 3) dealt with in the following subchapter.

### **2.3. MPT.Br - Improvement of the Brazilian test process**

As presented by Pai et al. (2021) a software product is of high quality if there are no defects in the product, and one way to reduce and eliminate these defects is to apply a model aimed at this purpose. MPT.Br is a Brazilian test improvement model with a high result in software test quality as its primary objective. This model is designed, specifically, to meet the needs of SMEs (SOFTEX, 2019 and SOFTEX, 2011). As presented by Furtado et al. (2012, p. 220) the discipline of software testing is increasingly attracting the industry's attention due to the demand for quality products and the high level of competition in the market. This scenario can be supported by a maturity model that continually improves testing when applied to the software development lifecycle (SDLC). Therefore MPT.Br stands for improving the testing process and is presented as a test maturity model to help introduce testing disciplines in organizations. As it is a test model, there is a lower adhesion of national and international companies and little publicity. It is also observed that there are few references and frameworks for implementing a testing process model for IT companies in the literature. Neto (2014) explains that MPTBr is a solution compatible with international test models with low implementation, evaluation, costs, and an alternative for companies that aim to increase product quality (FURTADO et al., 2012).

MPT.Br is in version 1.0 and comprises a set of process areas. Each process area contains a group of practices (generic and specific), and when implemented collectively, they satisfy a particular objective. This model complements the presented CMMI-DEV and ISO 9001. It deals with the complete testing process, from conception to completion of the test environment, which is not observed in the abovementioned models (SOFTEX, 2015). MPT.Br has five maturity levels: ML1 (Partially managed), ML2 (Managed), ML3 (Defined), ML4 (Defect Prevention), and ML5 (Automation and Optimization). The Generic Practices are Reach Defined Results (PG1), Establish Organizational Policies (PG2), Plan Process Implementation (PG3), Identify and Provide Resources (PG4), Define Authority and Responsibility (PG5), Provide Training (PG6), Control Work products (PG7), Monitor and Control the Process (PG8), and Provide Senior Management with Visibility of the Process (PG9). The Processes Areas are Test Project Management (GPT), Test Project and Implementation (PET), Test Requirement Management (GRT), Test Closure (FDT), Quality Assurance (GDQ), Test Measurement and Analysis (MAT), Test Organization (OGT), Acceptance Testing (TDA), Static Testing (TES), Training (TRE), Product Quality Assessment (AQP), Management of Defects (GDD), Non-functional Testing (TNF), Automating the conduct of Tests (AET), Statistical Control of the process (CEP), and Management of Tools (GDF). The object of this research is the implementation of MPT.Br level ML3, where the organization's process is defined and integrated into the development life cycle (SOFTEX, 2011). It is also noteworthy that MPT.Br supports organizations to improve their testing processes and consequently improve the quality of the final product (FURTADO et al., 2012), which is in line with the objective of this work.

### 3. METHODOLOGY

This chapter is intended to address the methodological issues of the present work, where exploratory bibliographic research was used. According to Gray (2012, p. 87), to carry out high-quality research, it is necessary to focus on a high-quality database, where the academic databases Capes, Web of Science, Scopus, Science Direct, SciELO, and BDTD were selected, as well as the pages of the bodies responsible for maintaining and defining the guidelines of the standards indicated in the survey. This research used a documental survey and a data collection instrument application using individual interviews and focus group interviews. The action research method was also used in an IT SME in Brazil (Rio de Janeiro, São Paulo, Distrito Federal, and Minas Gerais). Its strategic guideline is to increase the quality of its products and services and achieve certifications. The sample universe was composed of 33 senior consultants working in project management, auditing, consulting, architects, developers, testers, HR, and process analysts. All are working on site. Of this total, the sample of respondents to this research consisted of 21 consultants who participated in the Focus Group or individual interviews. Finally, the triangulation of results was applied, seeking convergence to increase the validity of the constructs (Gray, 2012) and increase the reliability of the collected data and conclusions. (Zappellini and Feuerschütte, 2015)

The

### 4. QUALITY MULTI-MODEL INTEGRATED IMPLEMENTATION PROCESS

As stated by Garcia, Oliveira e Salviano (2016, p. 26), “the importance of works that aim to provide resources that support decision-making for software development organizations should be highlighted, as a way of facilitating the analysis and adoption of the model or standard that best suits their needs.” Figure 1 presents a qualitative consolidated view of the three models, with the intersections between the ISO 9001:2015, CMMI-DEV v2.0, and MPT.Br models.

		CMMI DEV																									
		EST	MC	PLAN	RSK	OT	PI	TS	VV	RDM	PQA	PR	SAM	SSS	CAR	DAR	CM	PAD	PCM	MPM	GOV	II					
		GPT				TRE	GPT	PET	FDT	GRT	TNF	GDQ	AQP	TES	-	-	GDD	AET	-	OGT	PET	TDA	MAT	CEP	OGT	GDF	
ISO 9001	PLAN																										
	4.1 Understanding Context			PLAN																					GOV		
	4.2 Interested Parties			PLAN																					GOV		
	4.3 Determining Scope			PLAN																							
	4.4 Management System			PLAN															PAD							II	
	5.1 Leadership & Commitment			PLAN																					GOV		
	5.2 Quality Policy																		PAD						GOV		
	5.3 Roles, Responsibility & Authority																		PAD						GOV		
	6.1 Address Risk & Opportunity				RSK																					GOV	
	6.2 Quality Objectives											PQA														GOV	
6.3 Planning of Change		EST								RDM							CAR	CAR-DAR							GOV		
DO	7.1 Resources						OT																				
	7.2 Competence						OT																				
	7.3 Awareness						OT																				
	7.4 Communication				PLAN																					GOV	
	7.5 Documented Information				PLAN																						
	8.1 Operational Planning & Control		EST	MC				PI							PR				CM	PAD		PCM					
	8.2 Products & Service Requirements									VV		RDM			SAM				PAD		PCM						
	8.3 Design and development of products and services		EST	MC	PLAN				TS		VV		RDM												MPM		
	8.4 Control of externally provided processes, products			MC					TS		VV																
	8.5 Production and service provision							PI	TS		VV		RDM			PQA	PQA							MPM	GOV	II	
CHECK	8.6 Release of Products and Services													PR		SAM	SSS										
	8.7 Control of non-conforming outputs												PQA						CM								
	9.1 Monitoring, measurement, analysis and evaluation			MC									PQA												MPM	GOV	
	9.2 Internal Audit												PQA														
	9.3 Management Review												PQA												MPM	GOV	
	10.1 Improvement - General					RSK																			MPM	GOV	
	10.2 Nonconformity/Corrective Action					RSK							PQA												MPM	GOV	
	10.3 Continual Improvement					RSK																			MPM	GOV	

Figure 1: The intersection of ISO9001, CMMI-DEV, and MPT.Br standards  
(Source: Prepared by the authors (2021) from ISO 9001:2015 (ABNT, 2015), CMMI v2.0 (CMMI Institute, 2018), and MPT.Br (Softex, 2011))

The proposal for implementing's a process of multi-models of quality is presented below, with its activities and requirements collected during the research and validated with specialists. Based on the analysis of the proposals presented by the various researchers using single or multi-model models, understanding of the ISO 900, CMMI-DEV, and MPT.Br, corporate knowledge, Figure 2 shows a process for implementing models in an IT organization. There are activities described in each subprocess in the following subchapters focusing on implementing ML3 that defined and standardized process for the organization. The activities marked with “\*” are mandatory for one or more models used in this research. The activities and respective guidelines below were based on models and experience during the period of integrated implementation of the ISO 9001:2015 (ABNT, 2015), CMMI v2.0 (CMMI Institute, 2018), Macro process, and MPT.Br (Softex, 2011)

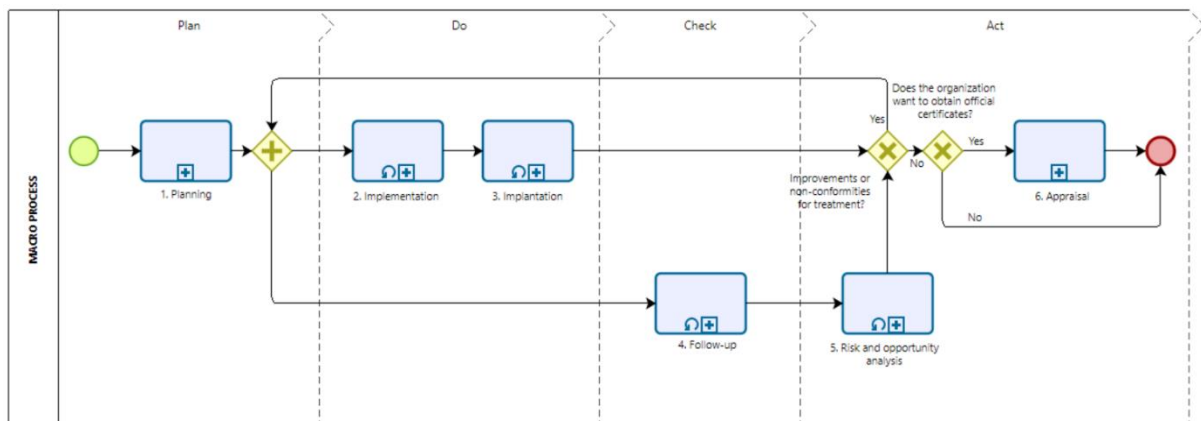


Figure 2: Macro process to the implementation of quality models  
(Source: Prepared by the authors (2021))

#### 4.1. Sub-process Planning

The following activities are carried out to guarantee the deliveries of the "1.Planning" subprocess: 1a. Ensure project alignment with the organization's strategic plan\*; 1b. Study and know the certificates to be adopted/implanted and map the models' requirements, processes, and standard practices, creating a map of correlations; 1c. Create a glossary matching the terms



between the models, forming a common language for the organization; 1d. Perform gap analysis\*; 1e. Identify the company's maturity and create an action plan to reach the weak points; 1f. Ensure the sponsorship and commitment of top management\*; 1g. Create a continuous improvement program and project for the organization\*; 1h. Define team responsible for the project; 1i. Establish the scope of the QMS\*; 1j. Create the quality policy\*; 1k. Establish quality objectives\*; 1l. Establish organizational context\*; 1m. Define improvement project roles and responsibilities\*; 1n. Identify and define stakeholders\*; 1o. Define improvement project management methodology\*; 1p. The plan improvement project, allocate teams, and prepare schedule \*; 1q. Generate baseline planning; 1r. Select project management tools; 1s. Develop project risk map; 1t. Perform project kick-off.

#### **4.2. Sub-process Implementation**

For subprocess “2. Implementation” has the following activities: 2a. Develop the organizational process map (primary process and support process)\*; 2b. Create performance indicators\*; 2c. Define and deploy tools: Redmine (project management); Testlink (test management), Mantis (error management); Jenkins (continuous integration). It is also necessary to have an organizational repository for storing the generated products. All the tools mentioned are free; 2d. Create templates/templates of documents for reuse; 2e. Develop a strategic plan\*; 2f. Document organizational chart\*; 2g. Develop all theses policies: Organizational policy\*, Quality policy\*, Organizational assets portfolio\*, Risk and opportunity management policy\*, Project lifecycle management policy\*, Change management policy\*, Indicator management policy\*, Configuration Management Policy\*, Standard Work Environment Policy\*, Verification and Validation Policy\*, Team Building Rules Policy\*; 2h. Develop procedures: Document and records control procedure\*, Storage procedure\*, Supplier management and evaluation procedure\*, Satisfaction survey procedures and Quality audit procedure\*; 2i. Establish the tactical training plan \*; 2j. Establish the organization's training operational plan\*; 2k. Create a map with the skills, experiences and, qualifications needed for the processes\*; 2l. Develop asset library (strategy, process, policy, procedures, and templates).

#### **4.3. Sub-process Implantation**

To guarantee the deliveries of the subprocess, “3. Implantation” has the following activities: 3a. Develop audit checklist to support audits\*; 3b. Audit processes, policies, documents, and templates and record non-conformities for deviations \*; 3c. Treat non-conformities\*; 3d. Generate baseline asset library\*; 3e. Allow consultants access to the asset library\*; 3f. Communicate the release of the asset library\* to the organization; 3g. Train consultants in processes, policies, rules, and procedures\*.

#### **4.4. Sub-process Follow-up**

For subprocess “4. Follow-up” has the following activities: 4a. Select projects to implement the new model\*; 4b. Appoint a team to support the implementation; 4c. Monitor and control the execution of development projects\*; 4d. Analyze execution and create corrective actions if it is not within the expected result\*; 4e. Monitor performance indicators; 4f. Hold a critical analysis meeting with senior management\*; 4g. Create the corrective actions for the review meeting\*; 4h. Develop criteria for evaluation and selection of suppliers\*; 4i. implementing\*; 4j. Update risk and opportunity map; 4k. Conduct customer satisfaction survey \*; and 4l. Document lessons learned from projects\*; 4m. Generate project reports (software development and improvement) and report the results to top management\*.

#### 4.5. Sub-process Risk and opportunity analysis

The needs of the subprocess “5. Risk and opportunity analysis” are 5a. Evaluate risk map and analyze opportunities; 5b. Create actions for identified risks and absorb improvement opportunities; 5c. Treat actions risks and explore opportunities; 5d. Communicate the result of the opportunity analysis \*; 5e. Hire an external audit\*; 5f. Perform external audit \*; 5g. Perform analysis of the result of the external audit: treat non-conformities\* and implement suggestions for improvement, if relevant to the companies.

#### 4.6. Sub-process Appraisal

To guarantee the deliveries of the subprocess, “6. Appraisal” has the following activities: 6a. Plan for evaluations with official certification bodies; 6b. Hire official appraisers; 6c. Select projects to collect evidence\*; 6d. Collect the evidence \*; 6e. Create a repository for evidence and proof; 6f. Create evidence map; 6g. Schedule official assessments; 6h. Communicate the evaluation schedule; 6i. Train consultants in the processes, policies, standards, and procedures for evaluation that will be interviewed; 6j. Conduct official assessment; 6k Withdraw access to evidence repository and safeguard evidence\*; 6l. Receive an official assessment report with opportunities for improvement and implement improvements relevant to the organization; 6m Wait for the final evaluation result to be officially released and 6n. Disseminate the result of the internal (for the organization) and external (customers and partners) evaluation. A total of 73 activities, with 58 mandatory deliverables, originated from the response of the literature action research and consolidated in the proposal to implement multi-models and the process for obtaining official certificates. This result responds to the objective proposed for this research.

### 5. CONCLUSION

This study aimed to propose the implementation of the multi-models: ISO 9001:2015, CMMI-DEV ML3, and MPT.Br ML3 aims to improve products derived from processes for IT SMEs. To achieve this objective, we used Exploratory Bibliographic Research, Action Research, and Triangulation of the results, which were the foundations for the results found and described in this study. It is observed that in the researched databases, up to the present date, references on how to implement multi-models in an integrated manner were not found. The ISO 9001 and CMMI-DEV models are widely disseminated and known worldwide, but the MPT.Br model, which is Brazilian, is less known, has few references, and supports the entire test management process. It is also noteworthy that this model has the lowest implementation cost and essential requirements to improve the software quality testing process delivery. It is necessary to study and know the models to be implemented to evaluate the synergy and adhesions between the selected standards. This assessment results in better planning of activities for deployment and the order of possible assessment. It was also observed that the initial work of gap analysis is of fundamental importance for planning and defining the strategy of which model should be implemented first and which company's most significant deficiency. It is understood that the process described, with the detailed activities, speeds up the implementation of models, directs services to the standards presented, reduces costs, reduces the risks, and increases productivity, making these SMEs more competitive. It is recommended as a suggestion for future research: a) possibility of the process proposed in this research, to be adopted for the implementation of any quality models and not just the standards indicated in this study; b) map the financial gains by deploying multi models instead of isolated models; c) prepare a study with the selection criteria for the adoption or refuse by the companies of a quality model, and finally d) prepare a qualitative study with the standard requirements and divergences of the leading models implemented by the companies.

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## GOVERNANCE IN CHARITIES: THE CASE OF THE PORTUGUESE MISERICÓRDIAS

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### **ABSTRACT**

*Non-profit institutions have grown considerably over the last few decades, nevertheless without the management models and governance practices having kept pace with such evolution. The adoption of good governance practices is seen as a way of improving management and transparency in disclosure, looking forward to adding value to the institutions. Accordingly, this research aims to understand the importance of adopting suitable governance practices and principles, using the case of an antique and particular type of Portuguese charities: the Misericórdias. These historical institutions need to modernise and professionalise so that they can continue to innovate in their responses to the most pressing social problems, adopting management models and typologies of information contrary to the informalism that characterises them. The adoption of governance practices and principles aims to increase the value of institutions and facilitate access to resources, contributing to their sustainability and continuity. It then becomes obvious that developing an empirical investigation is justified, aimed at determining Misericórdias' degree of governance adoption and whether they can lead to an optimised performance, guaranteeing their sustained development. The research outcome intends to capture the existence of suitable governance practices, which may be considered a driver of principles promotion, such as equity, transparency, accountability, and responsibility, generating greater confidence in the generality of stakeholders and ensuring a more efficient performance and an enhanced organizational output.*

**Keywords:** *Governance, Accountability, Transparency, Charities, Misericórdias*

### **1. INTRODUCTION**

The reduction in the activity of the welfare state in developed countries led to the proliferation of non-profit institutions in several countries (Helmig, Jegers & Lapsley, 2004). The state highlights the importance of the services provided by non-profit institutions given their proximity to citizens, efficiency in the allocation of resources, innovation, dedication and effectiveness demonstrated (Liou, 2001). These institutions increasingly play an essential social economic function by guaranteeing responses to local social problems in the sense of proximity and solidarity. The proliferation of non-profit institutions as a response to the state's progressive inability to resolve many of the social problems that affect current society arouses the interest of studying governance practices and principles as a means of ensuring efficient performance as well as the continuity of these institutions. Their expansion was due to increased demand for services, private sector participation in social issues and greater professionalisation that essentially sought to seek their sustainability (McKinsey & Company, 2001). The number of non-profit institutions has grown considerably over the last few decades however, management models and governance practices have not accompanied this evolution. Given their public nature and the scarcity of resources that non-profit institutions operate with, the issue of trust is very important given that donors of financial resources wish to ensure that these same resources have been and are being used in an honest and efficient manner.

Communication with donors as to the non-profit entity's use of resources and activities is vital to the continuity of the respective donation (Sargent, 2003). The efficiency with which these institutions spend the funds entrusted to them has become an increasingly important aspect of their actions and transparency in efficiency, including the reporting of relevant measures and information to understand, contextualize and evaluate it, is deemed important to *stakeholders* (Hyndman & McConville, 2016). Despite the philanthropic and charitable nature with which non-profit institutions operate, at the basis of their good functioning are integrity (ethical issue and basis of trust), transparency and *accountability*. In charities there is a strong relationship between financial accountability, transparency and trust (Farwell, Shier & Handy, 2018). Given the public interest in effective and well-run non-profit institutions, society has an interest in adequate financial disclosure that enables the public to make informed decisions (by contributing) and monitor the use of their resources. The scarcity of publicly available information on non-profit institutions, their management and how donated resources are used, makes it difficult for donors, as well as the general public, to select the beneficiary entities to support. The exercise of transparency is therefore a modern-day imperative necessary for their survival. The success of the non-profit sector depends not only on its economic and social activities, but also on its ability to demonstrate accountability and transparency, which in turn can help improve trust (Connolly & Hyndman, 2013b; Cordery & Morgan, 2013; Keating & Frumkin, 2003; Morgan, 2012). The view prevails that non-profit institutions that seek resources from stakeholders need to demonstrate transparency and accountability in the use of resources received (Abraham, 2007). Disclosure is a necessary first step towards *accountability* and towards more and better *accountability*, if the rationale for disclosure is clear, if the data disclosed is accurate and comparable, and if there is a receptive public, with the necessary resources, to respond to the information disclosed. Disclosure is not an end in itself and in the absence of related control procedures, disclosure may not provide effective oversight of charities (Breen, 2013). Non-profit institutions are subject to stringent transparency and *accountability* requirements from the state and other funders as a means of ensuring they are carrying out their work and using resources appropriately (Marshall et al, 2018). There is growing interest from donors and volunteers in monitoring the internal management mechanisms that ensure that resources have not been poached by managers, so it is critical that these institutions develop and publicise the presence and effectiveness of control mechanisms that keep managers to an acceptable level of discretionary action. Common governance practices - such as independent boards of directors, CEO oversight and transparency - increase the degree to which the resources of these institutions are allocated to their missions (Blevis, Eckardt & Ragozzino, 2018). In effect, there will be greater motivation to support the development of these institutions if their activities and the competence with which they are carried out are known, and if those who allocate the resources are concerned with their use and maximising the satisfaction of the needs that these institutions aim to meet. *Accountability* assumes particular importance in these institutions, since the donated funds should be used to fulfil missions that provide welfare to society (Yasmin, Haniffa & Hudaib, 2014). In non-profit institutions there should be public concern as to whether the resources entrusted to them are being used properly, effectively and efficiently, so these institutions should be required to disclose and clarify how they have exercised their responsibilities. They should be seen as an example in good governance practices, since they are not self-sufficient and it is desirable that they develop, and their survival depends on raising donations and other resources (Vinten, 1997). Good accounting and reporting (an important aspect of *accountability*) directed at key stakeholders is essential (Hyndman & Jones, 2011). To be useful, *accountability* must be targeted at different stakeholders, and the preparation and publication of high-quality reports for donors and beneficiaries is as relevant as the information needs of many of the external stakeholders, who rely on formal and informal channels of information (Connolly & Hyndman, 2017).

The increase in the number of areas in which non-profit institutions operate increases the need to professionalise their resources, whereby mere voluntary work gives way to a strategic vision and financial rigour. These institutions will tend to be more efficient when the people involved share the same values and ideas about the purposes and how they operate, making it inevitable to invest in the professionalisation of those running these institutions. The adoption of good governance practices aims to increase the value of the institutions, facilitate access to resources and contribute to their perennality. Good governance practices are seen as a way to improve management, related to the issues of professionalization of management and transparency in the disclosure of their actions. Several authors, such as Craft & Benson (2006), consider that it is rare to find efficient management at non-profit institutions and thus the need to reorient their governance from an amateur status to a professional one. Liou (2001) also defends that non-profit institutions face problems in as much as management skills are concerned, present failures or even the absence of coordination and overlook transparency and *accountability* norms. For Hyndman & McKillop (2018), these institutions are determinedly focused on achieving social objectives and have traditional management (and governance) norms that are more committed to partnership than to control or direction and thus, the levels of trust in these institutions are generally high, reflecting the enormous value and appreciation expressed by the general public. Good governance processes at non-profit institutions are vital to support management decision making and adequate *accountability* and this may be desirable, or even necessary, for the continued health and growth of the sector (Hyndman & Jones, 2011). Connolly, Hyndman & McConville (2013), recognise the importance of good governance as the basis for underpinning effective and efficient performance and for ensuring that charities meet the legitimate aspirations of key stakeholders. Governance mechanisms (oversight, monitoring, audits) improve the accuracy of non-profit institutions' financial reporting (Yetman & Yetman, 2012). As per Hyndman & McKillop (2018), based on the literature review, important research *gaps* are identified, which convey an opportunity to reflect on some of the key changes that are taking place in relation to, particularly, governance in non-profit institutions. Contributions, not only provide evidence to assess and guide the introduction of new practices and processes within the sector, but also seek to inform policy making, not only at the state level. This type of work supports decision-makers in strengthening these institutions so that they can be legitimised with the public interest and become more trustworthy and accountable. The adoption of governance practices and principles and the implementation of governance mechanisms are of enormous importance in more professionalised and transparent management, making it possible to monitor the proper use of the resources made available and to gain a better understanding of how non-profit institutions are being managed, mitigating information asymmetries and seeking to converge the interests of all related parties, maximising the creation of value. This study aims to assess the degree of adherence to governance practices and principles in the Misericórdias, as well as to understand which governance mechanisms (internal and external) are implemented and what is their relationship with an optimised performance, guaranteeing their sustained development.

## **2. THE THIRD SECTOR AND THE MISERICÓRDIAS**

The Social Economy, Non-Profit Sector or Third Sector have gained prominence in Europe, filling functions and segments of society that the private sector (maximising profit and return on invested capital) and the public sector (responding to the problems of society) cannot satisfy (Chaves and Monzón, 2001). Despite the variety of terminology used (Social Economy, Non-Profit Sector or Third Sector) to designate organisations characterised by not having profit as their purpose (they do not distribute profits to interested parties) and by sharing the same mission (satisfaction of community needs), the Third Sector is attributed an agglutinating meaning of the non-profit sector and the Social Economy.

The members of these non-profit organisations, although not receiving profits for the use of resources, are entitled to their allocation in the pursuit of their ends (Ben-Ner and Jones, 1995). In the quest for financial sustainability, these organisations may generate profits with some of their activities as long as they direct them towards the realisation of their main objectives, that is, they are characterised by the allocation of the surplus generated with their activities in the realisation of their end or mission (Hallock, 2002 and Hopt, 2010). The expression Third Sector was marked by the American John D. Rockefeller III, when he published in 1975, the first detailed study on the importance of private business initiatives with public character in American society. In the eighties of the last century, the expression became popular in Europe (Cardoso, 2000). The term Third Sector, due to its comprehensiveness, is the most commonly found in different contexts and the one that has a transnational expression (Ferreira, 2009). Whilst in the United States of America, the expression Non-Profit Organisation (NPO) - *nonprofit organisations* - and voluntary organisations in general is used, in Europe the expression Third Sector or Social Economy is used, the latter terminology being used in the Portuguese basic law that frames these organisations (Law no. 30/2013, of 8 May - Basic Law on the Social Economy). With this Law, Portugal is considered one of the first countries in Europe to have specific legislation for the Social Economy Sector, defining it as the set of economic-social activities, which aim to pursue the general interest of society, either directly or through pursuing the interests of its members, users and beneficiaries, carried out, among others, by the Misericórdias. They are autonomous entities and act within the scope of their activities in accordance with the principles of the primacy of people and social objectives; of free and voluntary membership and participation; of democratic control of the respective bodies by their members; of conciliation between the interests of members, users or beneficiaries and the general interest; of respect for the values of solidarity, equality and non-discrimination, social cohesion, justice and equity, transparency, shared individual and social responsibility and subsidiarity; autonomous and independent management from public authorities and any other entities outside the social economy; and the allocation of surpluses to the pursuit of the purposes of social economy entities, in accordance with the general interest, without prejudice to respect for the specificity of the distribution of surpluses, proper to the nature and substratum of each social economy entity, as enshrined in the Constitution. The Misericórdias are among the oldest non-profit institutions in Portugal (Andrade and Franco, 2007). They have been in existence for over five centuries and their objective is to address social needs, as well as to practice Catholic worship in harmony with the principles of Christian doctrine and morality. The Misericórdias had an important and growing role in the Portuguese economy, "starting with the birth of Portugal, through the Roman Catholic Church and the initially "Obras da Misericórdia" (based on the Catholic spirit of help and the mercy of God) until the 15th century, where, due to the influence of the ideals of the Orders (mainly the Franciscan) and the profits that came from the time of the Discoveries, the first " Misericórdias" were established, as we know them today, in an organised manner and linked to the Church, and acting in the areas of Health and Education" (Santana, Campos and Castro, 2013). According to União das Misericórdias Portuguesas (2021), there are currently 387 active Misericórdias in Portugal (75 inactive). Santa Casa da Misericórdia de Lisboa was the first one in the kingdom of Portugal, founded on 15 August 1498 by Queen D. Leonor. The expansion of the Misericórdias throughout the kingdom was part of the Crown's effort to organise assistance. According to Sá and Lopes (2008), the Misericórdias emerged at a time of great national economic prosperity during the reign of Manuel I (1495-1521) with the aim of practising the fourteen works of mercy of the Christian catechism, meaning that they soon became comprehensive and multifaceted institutions that absorbed a varied spectrum of charitable practices. Despite being protected by royal power, on whom they directly depended, they acted with a great margin of freedom in relation to monarchic power and distinguished themselves from the others by their juridical nature, which



was civil, and by the activities that were of a social nature and directed outside themselves. Both Liberalism (1834-1910) and the First Republic (1910-1926) were characterised by a civilian nature. It was after the Revolution of 1974 that the state no longer considered them central to social protection; however the Misericórdias adapted and survived until today, continuing to be powerful institutions, assuming a wide range of services and maintaining the Christian spirit, responding in practice to the current formulations of social protection and solidarity that arise from the appeal to the dignity of the human person. Observing to the 15th Edition of "Quem Somos nas Misericórdias", from União das Misericórdias Portuguesas, in the year 2020, the Misericórdias supported 165.127 users daily and had 45.486 direct employees. There was, at least, one Misericórdia in each municipality of the country and autonomous region. The districts of Castelo Branco (with 26 Misericórdias), Évora (with 25 Misericórdia) and Portalegre and Viseu (both with 24 Misericórdia) had the largest number of Misericórdia. On average, each Misericórdia provided services to 427 users and had 118 direct employees, so their activity has been growing and relevant over time. According to the most recent data from the Satellite Account of the Social Economy (INE, 2016), relative to 2013, the GVA of the Misericórdias increased 10.2% and remunerations increased 16.3%, in line with the increase in remunerated employment. The Misericórdias concentrated 12.4% of the total GVA of the Social Economy, represented 12.8% of the total remuneration of the Social Economy and 16.8% of paid employment in the Social Economy. The "Compromisso" (Compromise) is the fundamental and statutory text of the Misericórdias and their governing bodies are the General Assembly, the Administrative Board and the Fiscal Council, also called Definitory. They have the status of Private Institution of Social Solidarity (IPSS), but with two very specific aspects. On the one hand, in the more historical and traditional sense, they are seen as Brotherhoods, with markedly religious objectives (satisfaction of social needs and practice of acts of Catholic worship, in harmony with their traditional spirit, shaped by the principles of Christian doctrine and morals), having a canonical statute, whose approval, when revised and updated, will be entrusted to the tutelage of the Church, as a guarantee of fidelity to canonical doctrine and discipline. On the other hand, they are seen as institutions of social solidarity, with specific welfare objectives (essentially, social support and health care), recognised as institutions of public utility, of collaboration and complementarity, materialised in the celebration of cooperation agreements, namely, with the State. Pereira (2002), sought to fill the gap identified regarding the little in-depth knowledge of the way in which the Misericórdias operate. Based on a survey of a sample of 89 Misericórdias, he concluded that the main objectives of the Misericórdia are the support to the elderly and children (more than half of the Misericórdia with these aspects), followed by the support to poverty, in which the aspects endowed with the largest number of equipment are precisely the day centres, the elderly centres and the crèches and kindergartens and that they mainly allocate their budget and financing to these activities; On average, it is the protocols with the State (which represent almost half of the revenues) and the provision of services, followed by donations, that have the greatest weight in the revenues of the Misericórdias; and the involvement in society is essentially based on their participation in civic actions aimed at defending social and humanitarian causes, as well as considering it a priority, in the future, not only to re-establish moral and ethical values, but also to maintain the concern for the elderly and to include in their projects the training of young people and support for socially underprivileged groups. Regarding the governance in the Misericórdia, he considers that the historical character of the Misericórdia is the main feature of the governance model, in which the governing bodies and their relationship remain unchanged (in some cases for over 500 years), i.e., the mission of the Misericórdia was fixed in the Compromise, whose rules guide the activities of the Social Bodies and the Brotherhood and inspire the operation of the Misericórdia. The governing bodies common to the Misericórdia, generally elected for periods of 3 years, are the Brotherhood (General Assembly) which elects the Administration (Assembly

Board), the Board of Directors (Administrative Board, whose President is the Provedor, who generally assumes executive functions) and the Ruler (Definitory - supervisory board). It also states that, from the literature review, Misericórdias do not provide a standard governance model, highlighting the following aspects related to governance in Misericórdias: they have a mission and act to publicise it; the members of the board of directors are volunteers, work part-time and tend to be elderly, with a low level of education (which is seen as an important limiter to the development of these institutions); they do not have a structured system of internal communication; the decision-making process is formal in nature and relatively centralised and hierarchical; the Agency Model is the one that best describes governance in the Misericórdias (weak active participation of agents other than the board of directors in governance decisions - Stakeholder Model); and besides the board of directors, possible (other) governance mechanisms are identified as the role of the State (by imposing conditions for funding contracts); the role of the employees (still tenuous, given that the decision-making process and the decisions of the board of directors is not shared with the qualified employees); the role of the "global organisations" (the role played by União das Misericórdias Portuguesas in governance decisions and its influence and relationship with Misericórdias); The role of the market - donors and customers (it is denied that the competition is a conditioning factor of the activity of the Misericórdias; in fact, the main revenues for the activity of the Misericórdias are the financing of the State and the services rendered, so it doesn't make sense to talk about competition in the market of donors and much less, in a "regulating" force). Furthermore, the National Statistics Institute (INE), in collaboration with the António Sérgio Cooperative for the Social Economy (CASES), conducted between June and September 2019, a Social Economy Sector Survey (ISES). This survey had the year 2018 as reference and was conducted to 6019 Social Economy (SE) entities, and 3550 valid responses were considered (which represented 59% of the sample), of which 377 responses, regarding Misericórdias. By family, the highest response rate was observed in the Misericórdias (76.7%). The survey was addressed to the members of the top management (executive body) of the Social Economy Institutions and intended to characterise the sector in more detail, namely in terms of the activities developed, internal composition, relationships with public and private sector entities, indicators for measuring the social impact of these entities and funding modalities, in addition to the analysis of management practices. Some of the results obtained were: in terms of organisational structure, almost all Social Economy families predominated the tier corresponding to 1 or 2 hierarchical levels (in the Misericórdias the tier corresponding to 3 or 4 hierarchical levels predominated); the majority of Social Economy entities developed networking or partnership work (in the Misericórdias the percentage was 85.4%); In terms of seniority, about 48% of the Social Economy organizations were senior (20 years or more) (in the case of the Misericórdias this percentage was 93.6%); almost 90% of the members of the top management of the Social Economy entities had executive functions (86.5% in the case of the Misericórdias); 62.9% of the Misericórdias carried out voluntary actions in the area of social action; 77.1% of the volunteers in the Misericórdias were covered by work accident and civil liability insurance; 19.9% of the Misericórdias did not use key indicators to monitor/evaluate the performance of their activity; 76.4% of the Misericórdias used social networks; in general, most of the Social Economy entities only prepared four management documents (Activity Plan, Budget, Activity Report and Report and Accounts) and most of these entities did not publish them on their *website*; Transfers or subsidies represent 28% of the total means of financing of Social Economy entities (32.6% in the case of Misericórdias); and among the guiding principles of Social Economy entities, established in the Framework Law of the Social Economy, the most valued was the principle of "respect for the values of solidarity, equality and non-discrimination, social cohesion, justice and equity, transparency, shared individual and social responsibility and subsidiarity.

### 3. GOVERNANCE PRACTICES AND PRINCIPLES

Non-profit institutions, in addition to their non-profit nature, have as their main mission to improve the quality of life of the population and contribute to their well-being, especially of the most disadvantaged, increasingly assuming an essential economic function, as a guarantee of social cohesion. For this they need to innovate so that they can continue to respond efficiently to the most pressing social problems, adopting management models that enable them to achieve sustainability and gain the confidence of society. Public trust in these institutions is essential to the achievement of their missions, while the lack of it potentially affects the sustainability and effectiveness of these institutions (Hyndman & McConville, 2018). Continuous updating and discussion of good governance guidelines has the potential to increase public confidence in not-for-profit institutions. Good governance processes are vital in supporting management decision-making, as well as appropriate accountability to key stakeholders, all of which are fundamental to the trust, continued health and growth of the sector. In structuring these processes, the spirit of non-profit institutions must be taken into account, as well as the role played by volunteers. Beneficiary involvement is increasingly accepted as an important aspect of good governance at non-profit institutions (Hyndman & Jones, 2011). It is also widely accepted that voluntary institutions providing services or making efforts to improve their services or policies shall involve their beneficiaries in decisions as to these services and actions, taking their interests into consideration and that their intensive involvement helps us understand that the management body is but one force amongst others to foster or resist progress and a specific aspect of governance and internal factors (Locke, Begum and Robson, 2005). The growing demand for quality in the provision of services and in the application of the managed resources leads these institutions to be essentially good managers and to demonstrate this. To this end, the adoption of good governance practices is inevitable, which arouses interest in exploring governance mechanisms and applying new management models as a way to become sustainable and achieve their social mission. Good governance safeguards the public interest and donors (Chokkalingam & Ramachandran, 2015). Governance plays a crucial role as it helps charities by making their donors want to give more money to the mission they intend to serve and has a positive impact on non-profits and common governance practices - such as independent boards, CEO oversight and transparency - increase the degree to which charitable contributions are allocated to the mission of these institutions. Also, professionalising these institutions benefits their stakeholders more and assists them in value creation by reducing agency problems, which affect all types of organisations (Blevins, Eckardt and Ragozzino, 2018). Governance aims to ensure that the interests of funders, donors, beneficiaries, civil society and the State are satisfied from non-profit institutions and, as such, these have a public function and disinterest in profit. As these institutions have a markedly social role, aimed at helping the most disadvantaged classes, and given the high amount of resources managed, the need to adopt good governance practices is justified. In order to avoid the misallocation of resources, governance is related to a series of restrictions applied to administrators (Shleifer & Vishny, 1997). It is recognised that good governance practices will not eliminate all failures of institutions, but if implemented, monitored and regularly updated, they will reduce fraud and help entities maximise the use of scarce resources. The same logic suggests that better governance practices in non-profit institutions would also lead to lower risks and maximise the use of scarce resources (Reddy, Locke & Fauzi, 2013). For Harris, Petrovits and Yetman (2017), strong governance reduces the likelihood of embezzlement. Monitoring by debt holders and the state, audits and internal maintenance of management duties is strongly associated with a lower incidence of fraud. In turn, McDonnell & Rutherford (2019) obtained results indicating that financial loss, fraud and theft and personal behaviour account for the majority of serious incidents reported and that it is the larger, older institutions that are more likely to report serious incidents.

However, it is in the smaller and younger charities that the regulator perceives there to be a greater risk of institutional death from serious incidents. There are approximately 200 distinct codes of good governance and best governance practices from institutions in 64 countries (Aguilera & Cuervo-Cazurra, 2009), the growth of which, in the opinion of Helmes, Postma & Zivkov (2007), has been accompanied by an increase in the publication of academic papers on good governance and its best practices. The social transformations that have taken place in recent decades call for governance practices in the non-profit sector, hence the Portuguese Institute of Corporate Governance (IPCC) published in 2014 the Code of Governance of Third Sector Entities. The adoption of this Code may bring benefits by proposing a set of guidelines, principles and recommendations that serve the reform of the current governance models of non-profit institutions, promoting principles such as equity, transparency (through *accountability*), *accountability*, sustainability and responsibility (compliance with objectives and the law), generating greater confidence in the generality of *stakeholders* and improving their performance. In the efficiency of the governance program is the performance of its main agents (Board of Directors, Management, independent audit and Fiscal Council), given the relevance of the functions they perform in the process of *accountability*, *fairness* and *disclosure*, considered by Andrade & Rosseti (2006), the three of the four pillars of good governance, namely: *Fairness* - sense of justice and equity in the treatment of financiers and donors, through the respect of minority rights and their balanced participation with the majorities; *Disclosure* - information transparency, with emphasis on those that affect the business and that involve risks; *Accountability* - responsible rendering of accounts, based on accounting and auditing standardization; and *Compliance* - compliance in the fulfillment of regulatory norms (by-laws, internal regulations and legal institutions). Larger charities tend to have much larger Boards of Directors than smaller charities and are more open to external initiatives, which impact on improving Board performance (Cornforth & Simpson, 2005). Finance, related to raising and managing funds efficiently, developing and reviewing budgets and maintaining the financial health of the organisation is the area that deserves the most attention and is considered vital to good Board performance (Craft & Benson, 2006). Saj (2013) confirms Ostrower & Stone's (2006, p. 618) suggestion that governance goes beyond the role of the Board of Directors to include the activities of the Executive Director, senior management, informal groups, individual Board members and staff. The relationship between the Board of Directors and the Executive Director suggests that each occupies a lane, on a continuum between institutional control (often established as the domain of the executive) and institutional governance (often established as the domain of the Board of Directors). The importance of good governance is recognised as the basis for maintaining effective and efficient performance, ensuring that charities meet the legitimate aspirations of key stakeholders, where an important one is high quality accounting and reporting Hyndman and McMahon (2010). Hyndman & McConville (2018) identified the main stakeholders, their information needs and listed a set of accountability mechanisms considered important by managers of institutions, to communicate and build trust with stakeholders: public mechanisms (reports and accounts - annual report and annual review) and private (direct reporting; participation; feedback; observation). While publicly available communications are essential to provide the basis for developing trust with some stakeholders (especially with less engaged stakeholders), they are not in themselves sufficient to build trust and meaningful engagement, so private mechanisms were seen as having the power to create relational trust (calculative trust), as stakeholders' expectations were not adequately met through publicly available communications. Dhanani and Connolly (2012), meanwhile, suggest that the annual report serves as a formal document of accountability, while the voluntary annual review primarily plays a publicity role. Poor accounting and reporting by non-profit institutions (and, as a consequence, the possibility of scandals) could severely undermine trust in the non-profit sector and reduce both donations and its activities, so more robust and reliable reporting

and accounting is desirable (Hyndman and McMahon, 2010). Institutions that raise more than half of their income are the ones that have disclosed the most information, and the reporting practices of institutions without fundraising are weaker (Dhanani, 2009). For Yasmin, Haniffa and Hudaib (2014) limited accountability in providing basic descriptive information, rather than judgemental and detail-based information, is due to: donors' high trust in institutions, with consequent reduced demand for the latter type of information; issues related to organisational and cultural structure; lack of internal professional expertise; and the high cost of accountability. A variety of forms of oversight and monitoring improve the accuracy of nonprofit institutions' financial reporting. Audits by large firms are associated with more accurate expense reporting, just as nonprofits with more donor-imposed restrictions on resources report more accurate expenses. Furthermore, charities engaged in activities subject to state oversight, with more stringent regulation and enforcement, report more accurate expenditures (Yetman & Yetman, 2012). External governance mechanisms (reporting and monitoring required in state funding contracts) and internal governance mechanisms (governance codes and traditional governance mechanisms) are related to the efficiency of the institutions (Jobome, 2006). According to this author, state funding is positively associated with a greater capacity of charities to redistribute funds to beneficiaries (probably the reason why external governance mechanisms accompany this funding) and the restriction on the use of funds that this state funding generally imposes on charities, as well as the restriction on the use of funds imposed by private donors (a traditional governance mechanism), can increase the efficiency of these institutions, so that state funding and governance requirements and traditional charity governance structures are positively related to efficiency. The adoption of corporate-type governance codes, on the other hand, is not positively related to efficiency in the fulfilment of the purpose of spending by charities. The solution to many of the management problems faced by non-profit institutions may involve the adoption of good governance practices (Carvalho & Blanco, 2007). For Claessens, Djankor, Fan & Lang (2002), good governance practices enable non-profit institutions to have easier access to resources, reduce capital costs, improve *stakeholder* reputation and institutional performance. Several researchers have found evidence of a strong relationship between organisational performance and governance practices (e.g. Gregg, 2001; Hilmer, 1998; Kiel & Nicholson, 2002), as well as studies linking improved governance practices to economic growth and development (Claessens, 2006; Clarke, 2004; Reed, 2002). According to Zainon et al (2012), there is a relationship between financial performance and the variable governance. Bellante et al (2018) confirms the existence of a strong relationship between governance characteristics and their performance (considered as their ability to obtain financial resources). As for Hasnan et al (2016), the relationship of the board's competencies and capabilities, including the experiences and skills of its members, with the support of political connections, influences the performance of these institutions. Governance generates conditions to optimise the performance of non-profit institutions, protecting the interests of all their *stakeholders*, so it is necessary to improve the practices that indicate how these institutions are managed and controlled, with special focus on the Misericórdias, due to their importance in Portuguese society.

#### 4. CONCLUSIONS

Non-profit institutions have grown considerably over the last few decades however, management models and governance practices have not kept up with this evolution. The basis of this growth lies in their essential social economic function in responding to the social problems that affect current society and the state's inability to solve them, which arouses the interest of studying governance practices and principles. The adoption of governance practices and principles and the implementation of internal and external governance mechanisms are of enormous importance for a more professional, transparent and accountable management,

making it possible to monitor the proper use of the resources made available and to have a better understanding of how non-profit institutions are being managed, mitigating information asymmetries and seeking to converge the interests of all related parties, maximising the creation of value and facilitating access to resources, contributing to their perennality. Given the importance of adopting governance practices and principles in non-profit institutions, which promote principles such as fairness, transparency, accountability and responsibility, generating greater confidence in the generality of *stakeholders* and ensuring a more efficient performance and taking into account the research gap regarding the adoption of these practices and principles of governance in Misericórdias, an empirical investigation is required aimed at determining their degree of adoption and whether they lead to an optimised performance, guaranteeing their sustained development.

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## SOCIAL DIMENSIONS OF DEMOCRATIC CHANGES THROUGH THE EYES OF BULGARIAN ETHNOPSCHOLOGY

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### **ABSTRACT**

*Various factors and circumstances influence social processes. The degree of the impact of these factors cannot always be identified accurately and fully enough. This research attempts to analyze the influence of prof. Marko Semov, believed to be one of the brightest minds who study Bulgarian ethnopsychology, on certain social processes. The reflection of his thoughts and theories on the modern social development of Bulgaria are fascinating.*

**Keywords:** *Social dimensions, Bulgarian ethnopsychology, Democratic changes*

### **1. INTRODUCTION**

Searching is a part of human life. It is the essence and the necessity to constantly make our choices. Whether they are fair, honest or random is ermined by what the outcome will be. I always tend to believe that it is justice and honesty and not the frivolous thrills and desires that should guide us when we make our choices. The inevitability of what is happening sometimes makes us think irrationally and look for something extraordinary and even strange in our current choices. Unfortunately (or maybe fortunately), these choices always take place, with or without our participation. And they are important both for ourselves and people around us. Therefore, even if we avoid the words society, need and development in making choices, it is the attitude of our choices towards society, need and development that fills their essence and our existence with meaning. And it is neither our philosophical thoughts, nor sociological research and promises of "bright future" that should determine what will happen, but rather the functional significance and rational future.

### **2. BULGARIAN ETHNOPSCHOLOGY AND DEMOCRATIC CHOICES**

A corr. member prof. Marko Semov is one of the brightest intellectuals in todays Bulgaria. He was born on 11 July 1939 in the village of Vidima, Troyan region (since 1976 a district of Apriltsi town). A patriot, an exceptional publicist and a writer who wrote more than 60 volumes. The popularity of these works makes him one of the most read Bulgarian authors of the 20th century. His travelogues "About Japan", "About America", "China – what are you actually?", "Land of Gods and humans" and many other books with stories and essays are among his most popular publications. His interviews and recorded meetings that survived until today as well as publication are priceless. A dissident and with free spirit, he became a victim of a party conjuncture before November 10, 1989. Due to the sentence "We accepted the abnormal in our lives as normal" in his show "Dialogues", in 1977 he was fired from the Bulgarian Television. Prof. Marko Semov for many years was a university lecturer, one of the founders of the modern science of Bulgarian folk psychology, as well as a host of the most scandalous television and radio programmes. His numerous works: "Bulgarian folk psychology", "Bulgarians versus power", "Virtues of the Bulgarians", "Complexes and paradoxes of the Bulgarian mentality", "Globalization and national destiny" and many others, as well as his hard tireless work as a lecturer helped him establish his own science school and inspire his followers. "Democracy cannot exist where there are hungry and poor. The hungry man cannot be democratic. The rich man would not be rich, if he had been so democratic" (Semov, 1997). This message was left to us by the ethnopsychologist Marko Semov. And no matter how many vicissitudes of time happen or how many days and years pass, we still remain people who want to be democrats.

But can we afford it?... “The complexes of one person or one nation, no matter what they are, are short false stops on the way to Golgotha of national self-consciousness. These are the wounds that every nation must heal and for which all intellectuals should seek healing” (Semov, 2004) – shares with us, today's and future generations, the sage Marko Semov. And not because we are from the same land, and not because I keep memories of Marko Semov, but because in order to make our choices we need healing and a lot of wisdom, which the words of people like him bring. Our very short memory makes us feel helpless and immature rather than strong and brave. And in such cases the question always is – what to do? And as a rule and norm, there is more than one answer. Albert Einstein, a genius and an insightful person, said that “Reality is merely an illusion, albeit a very persistent one”. We need to clarify the need for this real illusion and find a relatively correct and just solution through it. The right decisions are always difficult, the easy ones are objectively not the right ones, but they are made by “weak” people. And if the main problem is making the right decisions about our lives and ourselves, it is time to find those who would make these difficult decisions. Well, we are certainly in a difficult situation and the decisions that lie ahead will not be easy, prosaic or casual. Lao Tzu says that “When I let go of what I am, I become what I might be”. Well, our current situation provides us with a certain opportunity to be what we can be. Whether we like it or not is almost irrelevant. We are approaching that illusory reality with fast steps and an unpredictable feeling of the inability to appreciate this reality. And there is no philosophy in these confused thoughts at all, because it all happens in front of us in our lives. And our reckless wandering will not end this time either, because this is in our nature – not to look for the strength to make the right and correct (or difficult) decision and turn it into action. Walking through the small streets of the mountain town, where our great coeval Marko Semov was born, brings one of his thoughts to mind: “One eye looks to the East, the other to the West. And our history suffers from this political diversity. Because he who has no spine bends the lowest. That's why when we are offered a strong hand, we turn over backside” (Semov, 1997). Oh Marko Semov! The way he has formulated and arranged his thoughts in time and space so that they are useful not only today, but also in the future is incredible. Therefore, if sometimes you feel like shouting and screaming with anger and rage, it will hardly help sort out our difficult situation or meet our immature and meaningless expectations. Our wandering worldview seeks its own benefit and brings us trouble after trouble. We are sinking in search of this benefit, ostensibly for our society, for the people – its members, and we take it to ourselves as we please. And again, we can find the answer, which is so simple and clear, in “Complexes and paradoxes of the Bulgarian mentality”. Have we not become too diverse and have not exposed our political butts in this theater? A theatre in which the participants are all the same – with worn out, heavier and more difficult thoughts and without special opportunities. It seems normally and naturally the plays of our theatre meet failure after failure, that is why we start over with new expectations and desires. And although the environment and expectations are changing, they still lead in the same direction – to better and happier lives. But why we are not succeeding yet... Whether the actors or the director in this play of ours got confused is not entirely clear. But it is obvious that it is always the same. And we, supposedly participators of the show – sometimes applaud, sometimes boo, but in the end we all feel satisfied. We should not attribute too much cleverness and literacy to establish the obvious: “Encouraged by envy, we find it difficult to gather strength and find the courage to separate the small from the big, to hit the table and say – enough being stuck in the cobweb of our own envy, if we do not respect ourselves, how can we expect others to respect us...” (Semov, 1997) – again referring to the words of Marko Semov. We need sobriety and a lot of humility today to be able to expect a decent new performance of our theater. Therefore, let us trust the insight of the great Russian actress Faina Ranevskaya, who says: “Let go of idiots and clowns from your life. The circus must be on tour!” The expected reality is very real in Einstein's theory itself, which we will inevitably experience again, but not for the last time in

our lives. I wish we would make a definite and consecutive effort to what the famous American professor and doctor Oliver Wendell Holmes advises us: “A mind that is stretched by a new experience can never go back to its old dimensions”. Isn't it time to stop going back to the old dimensions and find more suitable and more acceptable ones for us Bulgarians! “We tend to compare ourselves with others rather than pay more attention to ourselves Because we are people who easily self-destroy. “Don't go to this country,” one Western politician wrote recently. – Even mosquitoes bite themselves there ...” (Angelova, 2021). Similar thought more than a century ago expressed Jirecek. How infinitely intoxicated we are by our own intemperance to be able to clearly assess and judge that we have fallen into the hole of our timelessness. We should urgently and quickly look for a good way out that would be acceptable to all and that would not hurt our human nature and also preserve our Bulgarian identity. And again, elections after elections that turn us into judges of people and events. Unfortunately, the fate we call “democracy” has determined this. Whether we can or rather – how much we are willing to do it – is a matter of time, assessments, events and actions that continue to strike us. “If we are to draw a Bulgarian politician, then he, with the exception of Stefan Stambolov and one or two others at most, should have a wet with saliva finger raised high – to feel the wind of time.” (Semov, 1995). This Bulgarian political reality is defiantly unrestrained. It intoxicates us until the next painful sobriety. I truly desire that we quickly realize that our misunderstood civilization is deadly wrong. Wouldn't it be better if we listen to the wise Bulgarians and their hidden thoughts and feelings rather than the greedy and wild peasants. We feel the need to add though that the villagers are smart people and the problem is not in our origin, but in the acquired by some unknown way and completely inexplicable abnormal immoral behaviour. “The grass of democracy needs mowing, watering, and mowing, and watering again, - as the Englishman had said. But it also requires years of care ... If we waste more time, the roots of the Bulgarian grass, no matter how tough it is, no matter how many historical events has happened on top of it, will rot”. (Semov, 1995). Maybe it is time we mowed our meadow and tried to at least grow something meaningful and good, otherwise we will harvest weeds and dandelion. And not just now, but for many years to come. Addictions, inviolability, pride, narcissism and many other illnesses are inherent in us. But perhaps, it is possible and desirable to find a cure. We are facing times of difficult yet important decisions. Our whole life is a series of such decisions. Depending on the time and place, depending on the bell tower from which we observe the world, our decisions are also important and difficult to different extent. Everyone has the right to think this way. But when these personal decisions lead to consequences, draw highways, not small paths, when they create or destroy spaces, dreams or inner desires, they are more special, and we must be much more responsible in terms of them. Because quite often the consequences of these decisions are very painful and long-lasting. But the measure or the meaning of determining the measure is the thing that should predetermine and direct this process in the right and fair direction. We, humans, live on this planet temporarily and in a certain place. And we must, even if we don't want to, share our thoughts and feelings fairly and honestly with those around us. Although we have always lacked this justice in the common sharing and it has led us to severe and not quite expectedly just crises. This is a very good time to find that thing, the one that we may not like, but which would free us from the pettiness of our carelessness, our emptiness filled with inner envy. Too painful a process that we will face sooner or later, whether after these or the next elections. people Because in so divided and even bleeding with tension times we are the ones who put, set or applaud at the top of the pyramid who are mediocre, illiterate and even bad. They have conquered spaces, times, and morals with this mediocrity, and they will not be easily get rid of it, because their senseless anticipation of their eternity is so unstable and unreachable that realizing it will lead to their complete collapse and fall from their narcissistic rostrum.

“Who and when lied to us that we are all equal before God, before the king and before our destiny? Who cursed us with this lie? Who hanged us on it, so for so many years since we are a state it always pulls us and makes us stumble as we run? We are nurtured with the illusion that we are equal and when someone manages to rise, we try to pull them down to our level” (Semov, 2022c). These are the words of the same Marko Semov, who is worth rereading and remembering. Being born in the small village of Vidima, hidden somewhere in the Balkan Mountains (now the town of Apriltsi), he found the strength and courage, even in those rather strange times to live, to shout: “We rarely compare ourselves to the better, more often to the worse. And it does no good. We do not know how to learn from our leaders – that is why we often bring out our national flaws rather than our national virtues” (Semov, 2022c). Now is the time for our fictional leaders to step down from their leadership pedestals and bear the burden of the past. And time will take care of the responsibility. Recent and distant history not only gives us examples, but often reminds us of their oblivion, insignificance and even uselessness. “You can be anyone in Bulgaria – but you cannot fall from power. Therefore, keeping power takes all means, both permitted and not. Therefore, contrary to all human experience, very often democracy in our country brings pain instead of hope. And maybe we will know that we have become a modern European country when democracy will stop hurting” (Semov, 1995). Democracy is a difficult thing – a way of life that meets the needs of all in this community. That is why there will always be those unhappy and insufficiently satisfied with meeting someone's specific needs – to find such a regulatory mechanism that will best reflect these expectations. Messages clearly and precisely describing it: “For those who experienced duels would not survive slavery. Those who survived slavery did not need duels ...” (Semov, 2004). Today more and more often we see the government, who are rushing on the yellow cobblestones (the central square in Sofia), and laugh at us because we make them wonder when and how to stop for a while... The government finds its place both in the works of the poet and the people and always finds its master. Whether this master is good or bad or just an apprentice – time will tell. And yet, time will determine us to be judges of its skills. Now it is still in that initial phase, which Konstantin Melihan briefly and accurately describes to us: “In order to control the mass, you have to convince them that their future is bright and their past is dark”. These suggestions and thoughts roamed in our minds in an incomparable way during the last years of Perestroika or complete change. All the same, but served and garnished with different spices, and to be sure they are authentic we often changed or replaced the chef. We Bulgarians are strange people – we like to be served the same dish and traditionally with hot peppers. And no matter how strange and deep delusions we fall into this reality of ours, it inevitably “among all of the powers subordinate to state authority, the power of money is likely the most reliable, states find themselves (admittedly not by motivations of morality) to promote a noble peace” – wrote Kant. Many give their advice, wise thoughts flow from everywhere and guide us on how and why to do this work in the best possible way. It is supposed to be simple and easy to govern, however it always turns out to be more complicated than we thought. This is not for everyone, as the older and wiser people keep saying, but why do we almost never hear these words expressed by those with rich life experience. According to Montesquieu “the principle of democracy becomes corrupt not only when the spirit of equality is lost, but also when the spirit of extreme equality is adopted and everyone wants to be equal to those he chooses to command him” (Davidov, 1980). And this vertigo of unprecedented expectations that this will happen and work out somehow, this madness I think has overwhelmed our people and does not give us peace. Publius said that “crazy is the one who being unable to control himself, wants to control others”. And to prove it – here we are again speculating on the reasons, which have long been known and proven over time. To hear the wisdom of time and to use at least part of this wisdom is a matter of intellect, mentality and most of all strength.

Now those who are cleverer have silenced themselves in an old and known Bulgarian way, others have lethargically let things happen and only a small part of the rest are trying to express or show what they think or warn about what needs to be done for a different outcome. Joan Rowling, the author of Harry Potter, in her book describes the current Bulgarian situation in a very accurate way. “Big “deal” – this is a man whose education exceeds the intellect”. And let us not forget that “the successful revolutionary becomes a statesman, the unsuccessful one becomes a criminal” (Erich Fromm). We are currently in a period of brief anticipation of who will be a revolutionary and who will become a criminal. If we don't guess correctly, we will try again and again – that's what democracy says and predetermines. But the democracy is a state not only of legal norms and order, but also of spirit. And the spirit is what we lack and something our essence is deprived of. All these topics and issues are of a very personal and even intimate nature, which define and place our society over again in a situation of seeking its salvation, and even in the so-called democratic way. Professor Marko Semov expresses some valuable thoughts about the future development, which is already happening to us: “What globalization is, is yet to be seen. Above all, it is an economic process. And where there is economy, there are interests. Neither the peoples of Europe nor the United States have given up their interests, and their identities. In fact, things are not as idyllic as some of our politicians think. Globalization is a process, but it also has its opponents. Americans have sociologists who study this process in depth. For instance, we are currently struggling to learn English. Even I study it. But the number of English speakers has been declining over the past 30 years, from 7.8 to 6.8 of the world's population. It was believed that the Internet and computers would make us speak the same language. Complete nonsense and ignorance. Currently, there are 25 Bulgarians working for Bill Gates – big brains, - who will soon develop a new generation of computers on which each nation will be able to communicate with other nations in their national language... Europe is scared enough of the harsh forms of globalization. But a forceful process, such as globalization, also gives rise to anti-globalization forces. Nations have not given up their identity in any way and will not do so, because it means leveling their cultures, depersonalizing them, and that would be the beginning of the end for culture in general. This would really be the end of civilizations. Well, if we get there, the drama will not be only Bulgarian” (Lyubenova, 2022a)

### **3. CONCLUSION**

Changes always happen – whether they are wanted or undesired, expected or unexpected, they come to us regardless of the degree of our readiness to endure them. Whether it will happen now is a matter of time, but also a matter of proper judgment and evaluation. A bad one would cause adversity that we would have to overcome in time and space. “Only if politics ceases to encourage dirty deals, privileges and easy protected by law thefts. And becomes a synonym for virtues, dignity and patriotism. But it has not been changing for a very long time. Only the idols change and not a single new scratch in the political behaviour of our rulers has appeared. They care for their people only in front of a microphone. But they are very resourceful to strike below the belt. Without realizing that worse than the political games of democracy, so characteristic of our political life, is the dictatorship. But even an enlightened dictatorship can be more useful than a dark and false democracy” (2022b). It is worth putting effort into understanding Marko Semov's ethnopscychology. And today we have more reason to talk about it. To find brave people to make difficult decisions for a democracy that will not hurt....

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# THE ROLE OF SOCIAL MEDIA IN SUPPLY CHAIN MANAGEMENT DURING THE COVID PANDEMIC

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## ABSTRACT

*Globalization and internationalization of the market pose great challenges to companies, impose new rules of behavior and create a highly complex market. Precisely because of the complexity, numerous changes, but also great competition, companies are finding new ways of doing business and creating new business models on which they base their business. Precisely in response to the increasing complexity of the market itself amid the globalization of business in the 1990s, the concept of supply chain management emerged. Companies are increasingly focusing on the concept of supply chain management, which is also becoming digital with the digitalization of business. Digital tools, methods, and techniques are available to businesses to make their business more visible, flexible, and interactive. Precisely these elements as characteristics of the use of social media in logistics business or within the supply chain management due to the covid pandemic create and enable in difficult business conditions further flow of daily activities with minimal obstacles. This paper aims to investigate and examine the impact of the covid pandemic on logistics business, ie supply chain management, and the role and impact of social media as support tools and methods for ensuring uninterrupted business.*

**Keywords:** social media, logistics, supply chain management, globalization, digitalization, digital transformation

## 1. INTRODUCTION

Conditioned by the constant and rapid growth and development of new digital technologies, companies have at their disposal to implement new technologies in their business processes, based on which they will achieve a competitive advantage, visibility, and sustainability of the business. Due to new technologies, markets are becoming complex, above all innovative and fast-growing. The process of digitalization and the related digital transformation of business are changing so far known traditional business models, so companies are increasingly oriented to new ways of doing business, conditioned by the implementation and application of new digital business models. It is the new digital technologies and digital business transformation that have proven to be the key to success and sustainability in the market due to the COVID-19 pandemic. The change in business and the market itself due to the COVID-19 pandemic has caused several problems in the business world, changing the way the market and all its stakeholder's function. All industries were affected by the COVID-19 pandemic, and business slowed down and became more difficult, which was extremely visible and had the greatest impact on logistics processes and supply chain. The supply chain is a key to the normal and continuous function of the market and has suffered heavy losses as a result of the COVID-19 pandemic, which has led to major and unplanned market disruptions. It is obvious that digital technologies (social media) were of great importance due to the COVID-19 pandemic and that for many companies, including the supply chain, they were one of the factors for the survival, visibility, and sustainability of the business.



## 2. DIGITAL TECHNOLOGIES AND SOCIAL MEDIA

Globalization and internationalization of business create a new digital market, new trends, and new business models that change the daily business of the company but also become a prerequisite and inevitable factor for normal functioning. New modern information and communication technologies (ICT) and digital technologies are being implemented and are part of almost every organization and industry that wants to create greater visibility, market recognition which ultimately leads to competitive advantage, long-term success, and ultimately market sustainability. The digitalization of the economy (and companies) implies the transition to a new technological order, which leads to the creation and acceleration of changes, both technological and organizational, and economic (Gumba et al., 2021). Therefore, companies are changing existing business models, switching to digital business models, and creating new directions of strategic direction oriented precisely to the digital way of doing business and the application of digital technologies. Authors Averina et al. (2021: 4) list three sets of strategic directions for the digital transformation of existing business models of organizations: “(1) operational and technological excellence (shifting the focus to improving value chain efficiency and introducing new production technologies); (2) excellence in customer solutions (shifting the focus to creating high levels of products and services); (3) proximity to the customer (shifting the focus to presenting value to the customer)”. Technological changes enable flexibility and simplicity in business, greater recognition, and visibility, which ensures greater competitiveness in the market. A proactive approach to consumers and all stakeholders through new technology is faster, more efficient, and more productive, which ultimately leads to the creation of loyal business partners. Companies that base their business on newer information and communication technologies base their strategic decisions on innovation and fostering competitiveness based on the internationalization of business (Onetti et al. 2012). Traditional business models are being replaced by digital business models, which is a process of digital business transformation that leads to increased efficiency and effectiveness and affects the business of the entire organization, and creates a sustainable competitive advantage (Vial, 2019). New technologies are available to companies from the aspect of implementation and use in the company, while companies recognize and adopt those that can be incorporated into their business processes and business models and that will be in the function of efficient, effective, and productive business. Knowledge and innovation today are the key to success. For innovation success in the market and creating benefits based on it, a company needs to have a technological advantage (technological innovation) or must be able to recognize, adapt and implement new technologies into business. One of the novelties of digital technologies and modern information and communication technologies is certainly social media (and social networks). Social media is a set of online applications, platforms, and media that aim to enable collaboration between people and the joint creation and exchange of content (Palmer, Koenig Lewis, 2009). Their integration into the business represents a revolutionary turn within the business and today it is almost unthinkable that the company does not use them. The main features of new media, including social media, are digital, multimedia, interactivity, hypertextuality. The trend of their use is becoming more intense, which confirms recognizing the benefits that social media provides to companies. One of the key characteristics of social media is certainly their interactivity, two-way communication with the market, greater visibility, and recognizability. Among the most popular social media, especially today's social networks, according to the number of users, are Facebook, YouTube, WhatsApp, Messenger, WEChat, Instagram, Twitter, LinkedIn. The choice which social media integrate and use in today's business process mostly depends on the needs of the company and how it can condition greater efficiency and productivity of the business. Social media (and social networks) today are a very suitable channel for selling and advertising products, and therefore can increase business performance and business performance, where we can talk about the close connection

between social media and supply chain as area and channel for selling and advertising products. Through social media, consumers can reliably and quickly find all the information about the product, information about the company's business, which in turn can greatly facilitate and speed up the entire logistics process and make supply chains more efficient. Social media (and social networks) are communication media, advertising media, sales channels because due to their interactivity they facilitate the promotion and distribution of media products.

### **3. SUPPLY CHAIN MANAGEMENT AND COVID-19 PANDEMIC**

The supply chain is the flow of goods, services, and information. It brings together many stakeholders and many activities to work together and to create the final product and what is the ultimate goal of the supply chain, added value. Monczka et al. (2010) describe the supply chain as a series of activities and organizations that materials go through during their journey from initial suppliers to end customers. The supply chain is part of the primary secondary and tertiary sectors and within the mentioned sectors covers the entire process and course of production (Crkvenčić et.al., 2018). It consists of at least two related companies between which materials (raw materials, semi-finished products, supplies), information and money are exchanged. The supply chain can be short and simple while on the other hand it can be long and complicated (depending on its complexity, length, and size; small or large number of suppliers and customers). Jobs performed within the supply chain that are invisible to the end customer are: (1) procurement and order, (2) transport, (3) receipt of goods, (4) storage, (5) inventory management, (6) preparation of delivery, (7) handling of materials and products, (8) industrial packaging, (9) management of returned products, (10) disposal of waste and depreciated equipment, (11) location decisions, (12) customer service, (13) demand forecasting, (14) production scheduling, (15) spare parts and services repairs. As mentioned, the supply chain is connected to the value chain, where together within the integrated business system and business processes they enable the flow of goods and their value, which leads to the creation of added value. It is by putting value-added aspirations through a quality supply chain, it needs to be managed. The concept of supply chain management emerged in the 1990s due to the increasing complexity of business and markets. Therefore, the logistics process and the supply chain grow into a supply chain management process (SCM). The supply chain management process includes an "integrated process that includes planning and managing all stakeholder selection activities, procurement of materials, a transformation of materials into the final product as well as related logistics activities within the entire chain (Zelenika and Pavlic Skender, 2007: 187). Furthermore, the author Van Weele (2014) defines supply chain management as the process of managing all activities, information, knowledge, and financial resources associated with the flow and transformation of goods and services from raw materials from suppliers to end-users. Among other things, the primary coordination of supply chain management is "coordination of the flow of materials, information and services from suppliers to the end customer" (Crkvenčić et.al., 2018). For the concept of supply chain management to work, it is important to establish a quality system of the organization that is successful at all levels so that the entire supply chain management process was then correct, high quality, and efficient. Supply chain management means managing the whole and all its components of the supply chain to meet all the requirements of all stakeholders involved, including end customers of products and service users. To be efficient, the supply chain requires adequate, quality, planned, and harmonized procedures. The COVID-19 pandemic has caused several problems and a collapse of the market. The supply chain disruption due to the pandemic, especially in today's globalized world, has faced businesses with several unplanned business disruptions. Stopping production and distribution has led to a series of supply chain disruptions globally. Traditional supply chain structures have been optimized and are not equipped to deal effectively with a growing number of unplanned business disruptions such as the COVID-19 pandemic.

To build a resilient supply chain, companies need to focus on strengthening their capabilities to help them prepare, anticipate and be ready to respond to future unforeseen events. To avoid unforeseen events that can have catastrophic consequences for business, companies need to increase the resilience of their supply chains, focus on working in agile and networked systems, focusing on (1) assessment and strategy (supply chain testing to identify possible critical scenarios and define potentials of activities), (2) capacity building (investing in key opportunities, increasing visibility, supplier procurement strategies, network flexibility), (3) smart monitoring (tools for monitoring and reporting potential risks requiring a timely response), 4) business processes (defining procedures within the process so that responses to pre-defined supply chain challenges can be addressed), (5) major crisis management (contingency plans).<sup>1</sup> In unpredictable situations such as the COVID-19 pandemic, companies affected by the same find themselves in big trouble for how long and which supply chain disruptions to suffer, and quick response to the required recovery time by creating operational supply chain policy (accepting temporary shortages, recovery plans, etc.). COVID-19 pandemic has caused problems in transport and logistics, leading to congestion in all forms of transport, transportation, and distribution which has led to shortages and collapses in all modes of transport. The author Ivanov (2020) states that during the COVID-19 pandemic is to expect the reduction of operational performance (EBIT), lack of material and price fluctuations. Disorders caused by previous epidemics such as Ebola (2013-2016) which created several market problems and negatively affected global logistics, with the current COVID-19 pandemic, can be a decision support framework to help predict the effects of epidemics on supply chains and coordinate operational and logistics policies during and after the crisis (Ivanov, 2020). External impacts on the company cannot be predicted or planned and the same is true with the COVID - 19 pandemic. The COVID-19 pandemic has left a huge social and economic impact on the entire world. Nevertheless, the events that have taken place and the pandemic that has taken over the world can be a reminder of future proactive thinking and reflection in business planning and creating new more efficient, and productive business processes within the supply chain. Today, supply chain transformations are more than necessary to be able to manage them effectively in the face of unexpected global situations. The agility of supply chains is crucial to ensuring the health and well-being of people around the world. Due to the extreme importance of the flow of goods in the world, the situation with supply chains is currently stabilized, but some consequences remain.

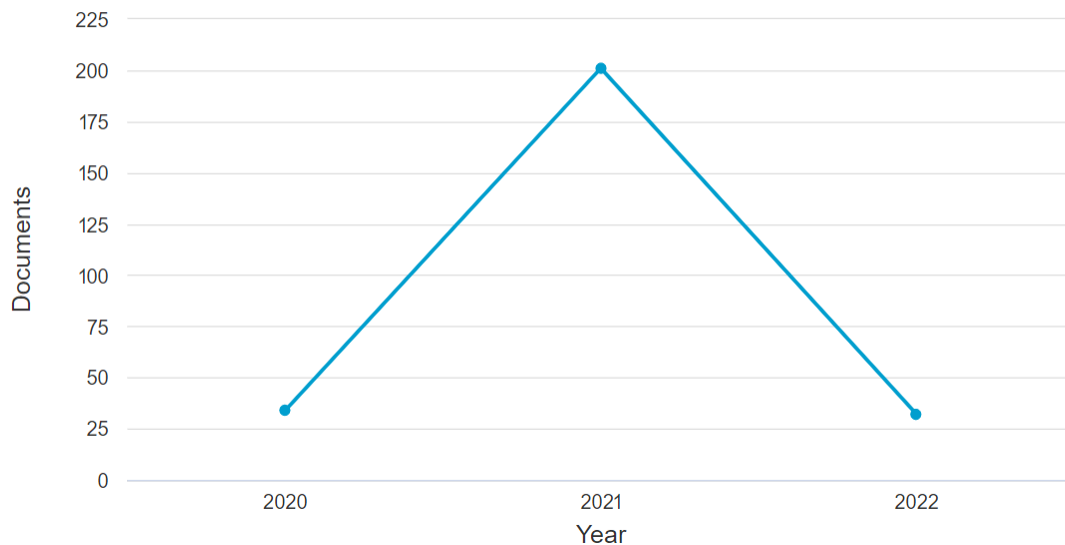
#### **4. METHODOLOGY AND RESEARCH APPROACH ABOUT CONNECTION BETWEEN SOCIAL MEDIA AND SUPPLY CHAIN DURING THE COVID - 19 PANDEMIC**

To research and review the connection between new digital technologies and supply chain management with an emphasis on the COVID-19 pandemic period, numerous world and Croatian literature have been researched. Papers within the Scopus, Web of Science, Google Scholar databases were used to gather information on the research topic which shows not so much research in the area that connects social media and the supply chain. To show insufficient research papers on this topic, we present here the results of searching Scopus. The search of Scopus using the following approach (TITLE-ABS-KEY (supply AND chain AND management)) AND ((social AND media)) AND (covid AND pandemic) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (LANGUAGE, "English")) resulted in the 267 scientific papers. Research topic on the role of social media in supply chain management during COVID-19 pandemic states results for the period from 2020 until 2022., which was expected since the COVID-19 pandemic started in 2020.

<sup>1</sup> [https://www.ey.com/hr\\_hr/consulting/how-to-forge-a-supply-chain-that-withstands-severe-shocks](https://www.ey.com/hr_hr/consulting/how-to-forge-a-supply-chain-that-withstands-severe-shocks)

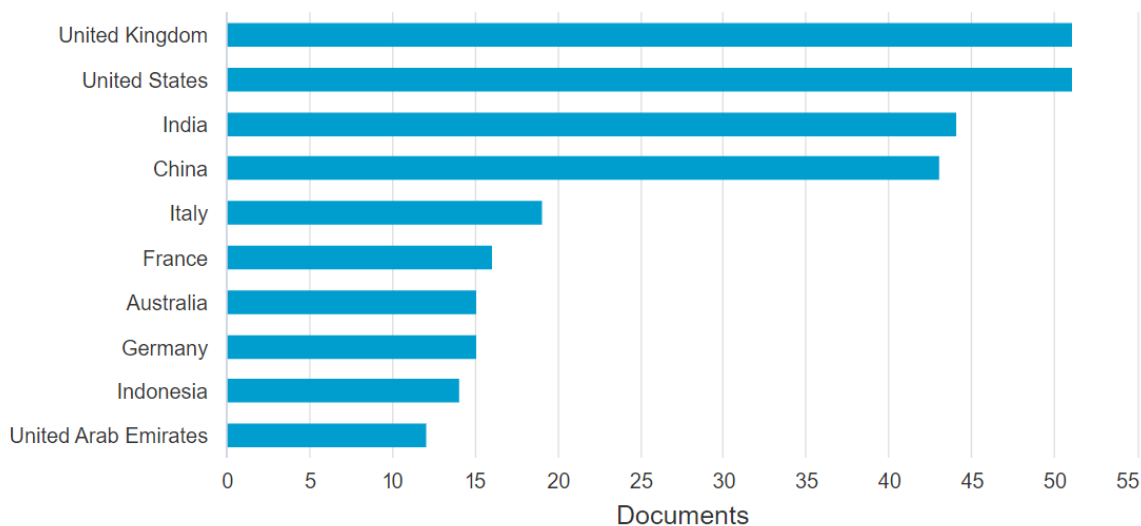
The number of papers that are investigating the role of social media in the supply chain during the COVID-19 pandemic has increased substantially in 2021 (figure 1).

Documents by year



*Figure 1: Number of papers that research the role of social media in the supply chain during COVID-19 pandemic in Scopus (2020-2022)*  
(Source: authors' work, 2022.)

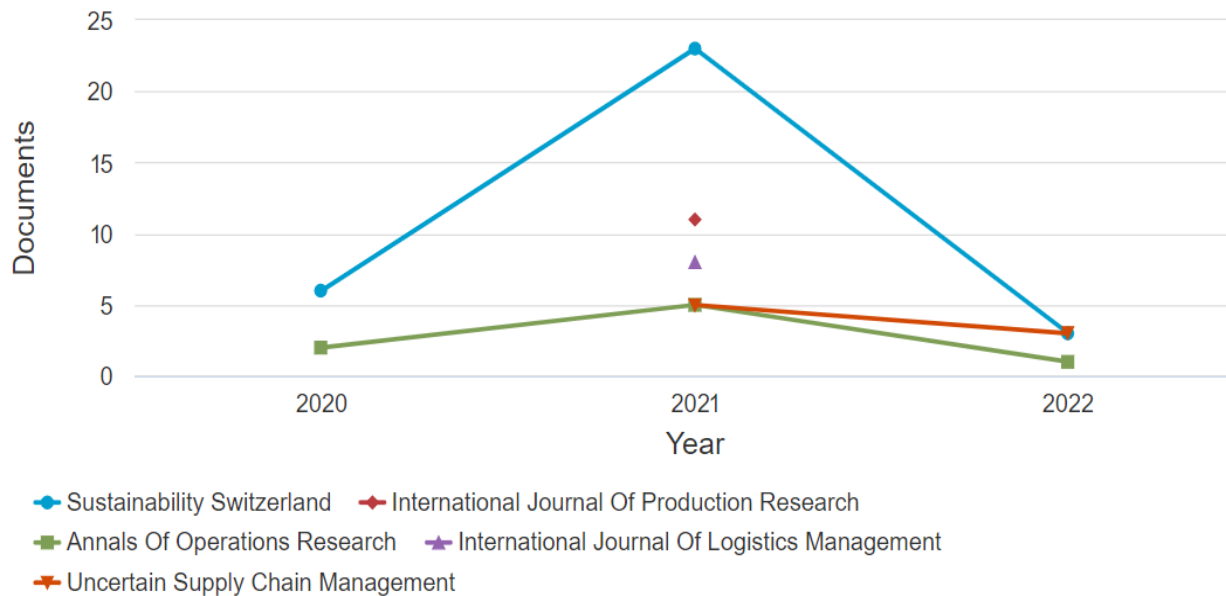
Most of the research papers were from the United Kingdom and United States (51 papers per country), India (44 papers), China (43 papers) (figure 2).



*Figure 2: Country of origin of the authors of the papers investigating the role of social media in the supply chain during COVID-19 pandemic in Scopus (2020. – 2022.)*  
(Source: authors' work, 2022.)

Figure 3. presents the journals that published the papers investigating the role of social media in the supply chain during the COVID-19 pandemic in the period from 2020 – to February 2022. in Scopus. The largest number of papers were published in Sustainability Switzerland (32 papers).

Other journals that published more than six papers on the role of social media in the supply chain during the Covid pandemic are International Journal Of Production Research (11 papers), Annals Of Operations Research (8 papers), International Journal Of Logistics Management (8 papers), Uncertain Supply Chain Management (8 papers), Environmental Science And Pollution Research (6 papers) and International Journal Of Logistics Research And Applications (6 papers).



*Figure 3: The journals that published the paper investigating the role of social media in the supply chain during the COVID-19 pandemic in Scopus  
(Source: authors' work, 2022.)*

But as mentioned, the role of social media in the supply chain during the COVID-19 pandemic is still insufficiently researched, which requires further efforts and research in this area.

## 5. BENEFITS OF SOCIAL MEDIA ON SUPPLY CHAIN DURING THE COVID - 19 PANDEMIC

The use of new and modern digital technologies enables the reduction of the level of stocks in the company's warehouses by digital supply chain management, which enables easier control and reduction of storage costs and lowers the costs of communication services. Global companies have good preconditions for creating common values in the global market, they contribute to the promotion of economic and social development and can accelerate the transformation into a sustainable economy by creating innovative technologies and products. Creating cost-effective solutions can create a market balance between economic, environmental, and social needs, leading to a sustainable future. What distinguishes today's modern and modernized supply chains from traditional ones is the faster and more efficient flow of information. With the development of modern information and communication technologies (ICT) and digital technologies through the supply chain, it is possible to optimize business processes, create a more efficient flow of goods and services, but also the information itself. For the supply chain to be efficient it must be integrated, coordinated, and optimized as a whole. In this way, it can be influenced to reduce operating costs and supply chain costs, maintain a high level of quality and influence create competitive advantages in the market. New information and communication technologies enable easier monitoring of business processes within the supply chain, enable their integration and optimization.

The supply chain and its management and governance is a complex system that strives to minimize costs and maximize the level of service to the customer, where new technologies facilitate the entire process and make it recognizable. Continuous globalization, business sustainability, innovation, integration, transparency, visibility are all factors without which it is impossible to do business today and create a competitive advantage, with new technologies creating and enabling greater visibility and thus creating a competitive advantage. Social media has become one of the most powerful (and easiest) ways to build relationships, and in the supply chain, they can serve management to strengthen relationships between all stakeholders involved. In addition to providing real-time information like no other medium, social media can be used to gather information about the functioning of the supply chain itself. Social media provides insight into how the service or product offered is perceived, offers information about relationships with business partners, but also information about the delivery itself. Businesses and supply chains are embracing social media today to expand their reach online and thus increase possible new sources of revenue. Through a more stable supply chain, customer satisfaction increases, and social media can create visibility based on better, faster, and interactive communication. Consumers believe that the information available on social media is more reliable than the placement of information by company management through traditional media (Mangold and Faulds, 2009). The author O'Leary (2011) investigates the impact of social media opportunities on the supply chain and analyzes whether the use of social media has effects on events within the supply chain as well as the impact of social media on building relationships between stakeholders within the chain. Burgess and Singh (2012) demonstrate a significant improvement in an organization's operational performance through the efficient use of its social system within the supply chain. Early adopters of dedicated platforms (some platforms of social media) for real-time communications within the supply chain are evolving solutions to improve communication and build valuable knowledge repository (Markova and Petkovska Mirchevska, 2013:98). If social media is embedded in business processes within the supply chain, the supply chain itself can gather a wealth of information from a wide range of different sources whether they are experts or just participants in the supply chain (O'Leary, 2011). Social media is a great opportunity to improve the performance of various business functions in companies.

## **6. CONCLUSION**

This paper aimed to analyze and explore the concept and characteristics of social media and the supply chain and to explore the role of social media in the supply chain itself during the COVID-19 pandemic. To achieve the set goals, several Croatian and international literature in the field of social media and the supply chain were analyzed, with an emphasis on the application of social media in the supply chain. However, this area is insufficiently researched, especially in the context of insufficient use of social media in the supply chain during the COVID-19 pandemic, which indicates a lack of recognition and importance of new digital technologies especially in these extremely demanding times of market disruption. Social media today is one of the most powerful (and easiest) ways to build relationships with company stakeholders, and in the supply chain, they can serve to strengthen the relationship between all stakeholders, increase visibility, business transparency, optimize, increase efficiency and minimize costs. The supply chain needs to recognize the importance of using social media to ensure sustainable business and competitive advantage. Digital technologies and digital business transformation have been key elements and drivers of the COVID-19 pandemic, but we can still talk about insufficient implementation, integration into business processes, and the application of digital technologies.

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## IDENTIFICATION OF CRITERIA FOR FUNDING RESEARCH PROJECTS IN BRAZIL

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### ABSTRACT

*Identifying aspects that can better distribute funding is a challenge both in Brazil and worldwide since Brazilian research funding agencies have limited resources to develop activities. Society and researchers alike expect results and the applicability of projects because of a local and global demand. On the other hand, at least regionally, the uniformity of criteria allows measuring the impacts of resources applied to research. Considering the areas of knowledge and using an exploratory qualitative analysis, this study sought to list a set of criteria and sub-criteria that guide the distribution of resources by agencies or institutions that promote research. As a result, we proposed a set of criteria for the promotion of research projects in Brazil that support the different areas of knowledge and favor the construction of a process that meets both current social demand, with answers to everyday issues, and comprehensive care, considering population aging and quality of life needs. The observation of how to develop regional development actions, the internationalization of universities, and the entire supply chain of existing knowledge production is also important, reinforcing that the government should be more effective in reducing disparities and increasing the quality of research in public policies for research promotion. Further studies can therefore analyze the distribution of resources for research promotion in Brazil which are common to different areas of knowledge, according to the classification of the National Research Council (CNPq).*

**Keywords:** *Criteria, public policies, research promotion, research quality*

### 1. INTRODUCTION

Society, researchers, and funding agencies are interested in whether the results of their research are applicable for both local and global demand (Fidalgo-Blanco et al., 2019). This demand and the scarce resources for research activities in Brazil indicate the need to identify aspects that can guide agencies for a better distribution of funding to support scientific research, both in Brazil and abroad. We must therefore discuss and evaluate the access to knowledge of the various disciplines in platforms and infrastructures (Constantinides et al., 2018). The international characteristic of addressing issues of the state of knowledge shapes policies that promote prosperity, equality, opportunity, and well-being for all. The academic performance of researchers also affects the structural reforms expected by society, which would contribute to a 3.3% increase in world GDP in 2019 (OECD Economic Outlook, 2018).



The international relevance of the work developed by researchers can be verified by the various themes and their metrics, which are published annually in outlooks by the Organisation for Economic Co-operation and Development (OECD), one of the most credible sources on the comparative evolution of research indicators and the legal basis for the definition of public research policies in Brazil (Campos, 2018). Resources for scientific research that follow the parameters of OECD favor the globalization of researchers since financial development has a two-way connection. In Korea, half of the population resides in the Seoul metropolitan area, of which 64% are researchers responsible for 50% of the gross domestic product (GDP) of the country. This contributes to the formation of a forum in a unique knowledge center to share best practices and advice on public policies, setting global standards (Lee and Kim, 2019). A public agenda should guide the use of resources to develop effective public policies according to the degree of priorities (Lotta and Favareto, 2016). The OECD thus created items to guide the evaluation process. Our research was based on 136 of these items, which can become indicators of public policies, classified as follows: the first 109 concern resources intended to meet research policy and experimental development; another 17 measure production and the impact of scientific and technological activities; finally, 10 economic series are used as criteria to calculate indicators, including fixed-price growth rates and research and development (R&D) expenditures, from the percentage of GDP or industrial value-added, which convert data into a common currency by comparing purchasing power parity (Ker and Galindo-Rueda, 2017). The OECD is the basis to analyze, discuss, and decide on possible solutions since it is structured by countries that discuss public and economic policies to develop the economy and the social well-being of people around the world (OECD, 2019). To classify indicators, we elaborated the following criteria according to the literature: Resources Applied to Research, Human Resources in Research, Measure of Scientific Production, Number of Patents Developed, Impacts of Scientific and Technological Activities in the Market and, finally, we maintained the Economic Series criterion. Based on the similarity of terms, Table 1 shows how these criteria were elaborated.

*Table 1: List of criteria used by the OECD to classify indicators*

<b>Criteria according to OECD</b>	<b>Authors</b>
Resources Applied to Research	Guimarães and Jannuzzi (2004)
Human Resources in Research	Wandasari et al. (2019); Lotta and Favareto (2016)
Measure of Scientific Production	Rau et al. (2018); Ker and Galindo-Rueda (2017)
Number of Patents Developed	Gomez Cordon et al. (2019)
Impacts of Scientific and Technological Activities in the Market	Wandasari et al. (2019); Brownson et al. (2018); Crespy et al. (2007); Gomez Cordon et al. (2019)
Economic Series	Pike et al. (2015)

*Source: Elaborated by the authors (2020)*

The mentioned criteria were chosen for a more structured analysis after studying and assigning sub criteria for project classification and human and technological development which ensure technical, scientific, and institutional legitimacy to the research. The existing consensus is that these indicators must be better applied, increasing invested resources and the internationalization of science for the sustainable development of countries (Cunha-Melo, 2015). Contrary to the current financial investment policy of national and international funding agencies, research funds suffer product allocation and cuts in the public sector (Guimarães and Jannuzzi, 2004).

According to this trend, in 2017, Brazil invested only 1.26% of GDP in research and development whereas the world investment average is 2.21% (The World Bank, 2020). Previous studies on the distribution of resources for research in Asia, for example, largely focus on presenting case studies to identify limitations (Fowler et al., 2018). Funding agencies themselves are therefore attentive to the context and emphasize the absence of theoretical studies that discuss internationalization for a more global focus of research strategies, according to the characteristics of each institute (Zanoni and Borim-de-Souza, 2018). We observe that the choice of criteria to organize resource distribution is lacking because it is difficult to equalize the interests of the three schools of knowledge of CNPq (life sciences, humanities, and exact, technological, and multidisciplinary sciences), which, when grouped by affinities, are the first hierarchical level of evaluation of the various areas of knowledge (Coordination for the Improvement of Higher Education Personnel – CNPq, 2020). Therefore, this study's objective is to identify a set of criteria to support decision-making on the distribution of resources for research in Brazil that are common to the various areas of knowledge, according to CNPq classification. These criteria are based on those adopted internationally and used by the OECD. This study seeks to expand the knowledge about the proportional distribution of research resources to all areas of knowledge according to priority for country development or temporalities and emergencies, such as research in health. We can therefore group criteria and sub criteria into aspects of impact to the development of critical sense and show society which are used to distribute resources destined for research in Brazil.

## **2. THE INTERNATIONAL ENVIRONMENT FOR SCIENTIFIC RESEARCH**

The Global Research Council (GRC) seeks to serve and benefit developing and developed countries to promote long-term research by organizing continental collaborations. The current structure has a virtual format to better represent research communities and achieve social purposes. Research promotion, used by Global Research Council participants, is largely expected to provide impacts, including: scientific impact, to expand knowledge; social impact, to develop societies; and economic impact, to promote innovation (Global Research Council, 2019). Although public revenues are required for a good performance of research activities, industries and the various segments of society are not interested in all segments or areas of knowledge. Transparency as a research policy practice provides promising means to reach objectives by facilitating access to data and methods and favoring research accuracy (Goodman et al., 2016; Warren, 2016). A decentralized distribution of resources for research could increase research and development (R&D) for local agencies to create research networks and mobilize knowledge and know-how, which generally do not reach political-national decisions (Koltveit and Askim, 2017). Public policies, particularly those which focus on the development of the productive chain of science, technology, and innovation, are undergoing significant changes in their orientations, moving from centralized to decentralized action. School activities should integrate the support policy for the training of teachers and human resources, from undergraduate research to PhD, as part of teaching and research policies (Wandasari et al., 2019). Institutional support is also essential to expand scientific production, either by publications or even as a criterion for tenure and promotion for teachers (Brownson et al., 2018). This way, creating a network makes it easier to make alliances and public-private partnerships which favor innovation and the creation of a bank for patent application (Gomez Cordon et al., 2019). Higher Education Institutions (HEIs) are important in scientific impacts to maintain journals of quality and stimulate the creation of opportunities for participatory exchanges of science, politics, and practice (Ker and Galindo-Rueda, 2017; Rau et al., 2018). Cooperative approaches thus strengthen, with various actors from the local context. Regions and local authorities are then increasingly shaped as favorable environments to act on R&D policies, which approximates levels of government (Gendźwił and Marcinkiewicz, 2019).

Countries such as England, France, Finland, and Japan have a centralized political structure and traditionally a uniform management of science, technology and innovation (STI) policies, even though regional actors participate in the formulation and implementation of STI policies within nationally defined policy frameworks (Crespy et al., 2007). Countries such as the United States, Canada, Spain, and Germany have greater interaction between national and local actors, since local authorities are more autonomous to develop and control their own policy areas. Therefore, focusing on a systemic factor increases the possibility of a lasting impact and favors the understanding and achievement of innovation policies at municipal and state levels, for a virtuous circle (Herrera, 2016). We must analyze the reasons behind the adoption of research policies, the relationship between the different levels of government, and the possible variations between the mechanisms used that help understand the dynamics of local research policy and factors, including actors, agencies, and learning (Lanahan and Feldman, 2015; Uyarra et al., 2017). STI policies should provide an environment that favors new modes of governance and includes new approaches to collaborations, eliminating the concept that all collaboration is good and contributes to progress (Bodin, 2017; Gorissen et al., 2018). The literature on the local processes that help develop research in a centralized system, such as in Japan and East Asia, shows that various levels of government support research in the private sector despite the complex political, national, and regional context (Mah et al., 2013). Thus, the most decentralized levels must have conditions that favor the standardization of data to institutionally monitor the execution variation of programs for an easier perception of the interaction between different levels of government, even in a vertical format (Okamuro et al., 2019). One of the main actions is the movement to increase the relationship between levels of government, actors, and non-governmental entities (Pike et al., 2015). The internationalization of higher education marks the relations between different universities and is at the center of the university sector, legitimizing the circularization of knowledge and education, which are closely related to globalization (Dal-Soto et al., 2016). However, the paradoxes of Brazil's development policy prevent equity in the internationalization of higher education, including the mastery of basic English language skills by current scholars (Borges and Garcia-Filice, 2016).

### 3. METHODOLOGY

This is an exploratory and qualitative study, developed from the exploration of the scientific and technical literature and a perception research with specialists. This study's qualitative approach was guided by the use of a sample selected in October 2019, composed by 16 members, of which two are researchers and teachers with a scholarship of research productivity – CNPq Produtividade em Pesquisa (PQ) level A or B, from each of the eight areas of knowledge (agrarian, biological sciences, social and applied sciences, humanities, exact and earth sciences, engineering, health, linguistics, and the arts). This sample was chosen because most of these professors are coordinators of graduate programs (GP) and directors of funding agencies in the Southeast, constantly participating in institutional decisions of resource distribution and perception in various fields. With the focus group (FG) structured as a data collection instrument, we started the first stage of the research to collect data that contribute to a better understanding of the attitudes and knowledge that are used to promote and develop research. Participants were informed that, although prior, the data would remain confidential and would be used anonymously for scientific research and process improvement. On the second stage, characterized by qualitative transcription of the data, we initiated the construction and identification of expressions specific to each area, capturing words used in the text that were converted into their own notes and verifying unusual aspects between academia and society. Figure 1 shows the three sequential stages of the research. After reviewing the literature and the obtained results and conducting an in-depth discussion, we started the third stage, which favored the treatment of the data and the identification of the applied criteria that meet various

areas by a consensus selection. We then organized a list of items to emphasize the main concepts based on the central axes that were suggested in the completion of the focus group and referenced by the literature. These items were used for analysis and conclusion by identifying points of convergence and divergence.

#### 4. ANALYSIS AND DISCUSSIONS

Of the 136 OECD items shown in a meeting using brainstorming, the teachers chose 101, which are not necessarily common to each of the areas of knowledge under discussion. Considering the common points of interest in the discussion, only 21 of these items could be grouped into four thematic axes: impacts, research funding policy, operating structure, and scientific dissemination. The focus group's in-depth analysis of the 21 items classified four items as criteria aligned with the thematic axes and the remaining 21 as specific sub criteria to each criterion. One criterion and four sub criteria were analyzed and, based on the reduced degree of attribute importance, defined as sub criteria that could be used with a lower weight. The other 76 observed items had the basis of criteria and sub criteria that meet the interests of the areas of knowledge and favor the construction of a decision-making process; however, they were discarded for not corroborating with the observed literature. The applicability in the supply chain of knowledge production therefore consists in transforming the resources applied into products for society, always assessing the high risk of an uncertain positive result (Gomez Cordon et al., 2019). Budget planning with scarce resources allocated for research strengthens the systematized use of criteria. We therefore developed numerical data sets reconciling the criteria and sub criteria (Table 2).

*Table 2: Definition of criteria and sub criteria*

Criteria	Sub criteria	Authors
Technological and Innovation Impacts	Number of activities performed with school students	Wandasari et al. (2019); Brownson et al. (2018); Crespy et al. (2007); Gomez Cordon et al. (2019)
	Number of publications involving scientific dissemination	
	Project contribution to product, process, or public policy innovations	
	Number of Patents Developed	
	Number of Public-Private Partnership Agreements	
Scientific impacts	Number of complete articles published in journals with index A	Rau et al. (2018); Ker and Galindo-Rueda (2017); Moral-Muñoz et al. (2020).
	Number of complete articles published in journals with index B1 to B3	
	Number of complete articles published in journals with other classifications	
	Number of books published	
	Number of chapters of published books	
	Number of projects approved as coordinator	
	Number of projects approved as collaborator	
Resource Generation Impacts	Number of masters formed	Wandasari et al. (2019) Lotta and Favareto (2016)
	Number of PhDs formed	
	Number of supervised post-doctoral researchers	
	Number of undergraduate research students who participated in the project (with or without scholarship)	
	Number of opinion articles and editorials related to the theme of the project	

*Source: elaborated by the authors (2020)*

Another set of evaluation criteria can be used in public notices or more complex calls. We emphasize that these criteria should weigh according to the demand.

Thus, extreme situations will use an additional criterion that can be divided in four sub criteria to guide the preparation of the notice, favoring the continuous improvement of existing processes and maintaining a single and simplified process to compare between the eight different areas of knowledge in detail. Table 3 shows the set of complementary criteria with lower weight.

*Table 3: Criteria that can be used with a lower weight*

Criteria	Sub-criteria	Authors
Scientific dissemination (Low weight)	Number of publications involving scientific dissemination	Ker and Galindo-Rueda (2017)
	Extension activities used in general in the development of the project	
	Activities of course organization and events organized in the project area.	
	Number of projects registered in SIGProj	

*Source: elaborated by the author (2020)*

We emphasize that, in this case, the focus group technique defined, above all, a protocol that guides the deep and collaborative discussion on the definition of weights needed to meet the demands of society and of those involved on the use of public resources and their returns. Although the notices and calls are limited (Rodrigues, 2020), robust criteria indicate the need to adopt strategic planning policies involving the states and institutions so a joint effort can reduce imbalances and meet demands.

## 5. CONCLUSION

This study proposed a set of criteria for the funding of research projects in Brazil and sought to base the various areas of knowledge, favoring the construction of a process that meets both the current social demand, with solutions to daily issues, and integral care, considering population aging and quality of life needs. Good shared practices are thus used as targeted and complementary measures for new discoveries to avoid their loss in the organizational context and to be used as a parameter for inclusion in new public calls. Since the law and the public notices of the various research funding agencies are insufficient, identifying common aspects to the different areas is essential to create human resources in research and must be associated with the structure of operation and the impact of scientific and technological activities as production measures. Balanced assessment criteria for research promotion policies requires the development of regional promotion actions, the internationalization of universities, and the entire supply chain of existing knowledge production. This reinforces that the government must be more effective in reducing disparities and increasing the quality of research in public policies for research promotion. For future work, we propose using techniques and methodologies that favor, by comparative studies, result management from a new process that adapts techniques and applications for graduate programs.

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## IMPACT OF PENSION FUNDS ON BUSINESS PERFORMANCE OF LARGE COMPANIES IN THE REPUBLIC OF CROATIA

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### ABSTRACT

*The aim of this paper is to analyse the impact of four mandatory pension funds in the Republic of Croatia on the business performance of large companies in their portfolios measured by return on assets (ROA). To analyse the impact of pension funds, the authors studied the lists of their investments from 2015 to 2019 and calculated return on assets, asset turnover ratio, profit margin and funds' ownership share in the listed companies. The data were used for panel analysis, which has shown that pension funds have an impact on the business performance of large companies in which they invest. The current paper adds to the literature dealing with the impact of pension funds on corporate governance of companies and examines it by means of panel analysis of their shares and financial indicators. The results of this research can be used by pension funds to rethink their investment strategies and make decisions that will ensure greater returns. Additionally, this study can serve as a basis for further research that could confirm these results or measure the impact of pension funds on the business performance of large companies by another financial indicator. Limitations of this study include a sample consisting of only mandatory pension funds for analysing their impact on business performance. Moreover, business performance can be measured by an alternative indicator. Therefore, future research could also include voluntary pension funds to investigate the impact of the ownership of pension funds on business performance of companies by using other performance indicators.*

**Keywords:** *Pension Fund, Business Performance, Portfolio Management Style, Panel Data Model*

### 1. INTRODUCTION

The development of pension funds is the fastest growing segment of financial intermediation services (Mishkin, Eakins, 2005). Two types of pension funds were created with the implementation of the parametric pension reform in the Republic of Croatia (2002), namely, mandatory and voluntary pension funds. The reformed pension system has changed forms of saving, enabling the insured to save by investing in pension funds rather than in gold or immovable property. The assets of pensions funds can be invested more easily, which contributes to the country's economy as well. Moreover, this broadens the investor base and encourages a more stable demand for securities. Participants in the second pension pillar include citizens, the state and fund managers, all of whom have different interests, which gives rise to problems, and receive different benefits from the second pillar. Citizens benefit from the second pillar in terms of higher pensions and increased returns on payments, while the risks include



double expenses – current employees and taxable persons save money for their pension by paying a contribution rate of 5 % to mandatory pension funds with the hope that their investments will generate higher pensions. The country benefits from the second pillar by way of financing its deficit by avoiding banks or the international financial market, whereas the risks include interest rates on the deficit caused by the creation of the second pillar. Fund managers only receive momentary benefits, namely, salaries and rewards, which depend on the performance of the fund at that moment. All risks are taken by citizens (Čavrak, 2016). The problem may be solved by increasing competition between pension funds (Vukšić, 2011). In general, pension funds represent contractual savings institutions, which collect assets by means of payments, i.e., contributions paid by their members on a voluntary or mandatory legal basis during their working life, promising them regular monthly payments after their retirement. Pension funds then invest the collected assets in long-term investments according to safety requirements and predictability of cash flows in the long term. These institutional investors are subject to rigid legal regulations that define company establishment, business operations and the investment structure since their primary goal is not only to maximize the profitability of an investment but also to safeguard the social security of fund members (Davis, Steal and Bolster, 2002; Orsag, 2015). Pension funds are classified as active or long-term investors, which have an impact on business performance while following stability and efficiency principles for investing (Štimac, Orsag, Dedi, 2015; Mehrani, Moradi and Eskandar, 2017). This is because it is easier for these institutional investors to predict and monitor the time horizon of payments, i.e., the drain of their members' capital, which facilitates long-term investing. Since pension funds invest a part of their assets over a long-term period, the costs of capital for companies decrease due to the decrease in term premiums and transaction costs. A positive aspect is that pension funds can contribute to the economy by means of investing in Economic Co-operation Funds (Vukšić, 2011). In the Republic of Croatia, pension funds predominantly invest in ICT stocks and it is important to reiterate that their activities on the market are a result of legal restrictions, well-developed investment plans and expectations for return on the invested assets (Klačmer Čalopa and Đundek Kokotec, 2019). In contemporary joint-stock companies, where there is a separation of ownership and management functions, increasing shareholder value at the expense of company satisfaction and social ambitions has become a requirement. Consequently, the system of corporate governance is of utmost value in this context, as it provides companies with guidance for increasing their performance and enhancing their operating activities by reducing agency costs (Matić, Papac, 2010; Orsag, Sabol, 2014). The available literature suggests that shareholders have a significant impact on business performance by way of reducing agency costs, while previous empirical research has confirmed the existence of a positive linear correlation between institutional investor ownership and business performance (Shleifer and Vishny, 1986; Leech, Leahy, 1991 cited in Weir, Laing and McKnight, 2002). Pension funds are among the most significant investors (Mehrani, Moradi and Eskandar, 2017). By engaging in corporate governance, pension funds fulfil not only their ethical but also their fiduciary duty. However, they also have a far more important role entailing an effective capital allocation and the monitoring of company operations, which directly leads to the fulfilment of their primary duty – maximization of shareholder wealth. In accordance with the relevant theory, investors strive to gain returns on the invested capital; therefore, they choose to invest in transparent companies whose value is expected to increase in the long term (Rappaport, 2006; Johnson, Scholes, Whittington, 2008). As it is in their interest, institutional investors are expected to continuously assess the performance of companies in order to oversee their own invested capital. When they fulfil their primary duty, shareholders will indirectly provide the entire market with necessary information, resulting in further engagement of new capital in certain companies, that is, an effective allocation of the capital that has already been invested.

## 2. LITERATURE REVIEW

Pervan and Mlikota (2013) conducted a study on the determinants of company profitability on the example of Croatian food and beverage industry. The dependent variable of their research was EBITDA ratio, calculated as a sum of profit after taxes, interest, and depreciation divided by sales revenue. The independent variables of their study included industry concentration, minimum efficient scale, size, debt ratio and asset turnover ratio. Risk was introduced as a control variable. By using a dynamic panel analysis, the authors analysed medium and large Croatian companies that operated in the food and beverage industry during the period from 1999 to 2009. The results of their research indicated that there was a relationship between past and current profitability based on EBITDA. In other words, the results showed a positive relationship between past and current profitability. It was found that concentration ratio had a positive and statistically significant influence on the profitability of the observed companies. Moreover, the results showed a positive relationship between company size and profitability, which indicated the existence of economies of scale in the food and beverage industry. Debt had a negative impact on profitability. Minimum efficient scale, risk and asset turnover ratio had no statistically significant impact on company profitability. Pervan, Pervan and Čurak (2019) studied the determinants of profitability in the Croatian manufacturing industry by using a dynamic panel data method. The dependent variable of their study was ROA, that is, return on assets, whereas the independent variables were divided into three categories: company-specific, industry-specific, and macroeconomic variables. The firm-specific variables of the research included age, current ratio and labour costs. The industry-specific variables included the Herfindahl–Hirschman index and capital intensity. The macroeconomic variables of the research included the inflation rate and the annual growth rate of GDP. According to the research, the variables that had a positive impact on company profitability included age, current ratio, capital intensity, the annual growth rate of DGP, and the inflation rate. Labour costs and high industry concentration had a negative effect on profitability. As part of her doctoral thesis, Knežević (2015) examined the factors influencing the performance of manufacturing companies by analysing panel data. Her model included ROA as the dependent variable; company size, financial leverage, debt ratio, liquidity ratio, asset turnover ratio, tangibility and sales as the internal independent variables; and the inflation rate, DGP and BELIBOR as the external independent variables. According to the study, size and an efficient allocation of assets had a positive impact on profitability while debt ratio had a negative impact. The selected external variables influenced profitability but to a significantly lower degree in comparison with the internal variables. Dimitrić, Tomas Žiković and Matejčić (2018) analysed the Prigorje-Gorski Kotar County and the Republic of Croatia in order to identify the determinants of profitability in the hotel industry. In their research, the dependent variable as a determinant of profitability included return on assets or, alternatively, profit margin. The independent variables were the cash flow to revenue ratio, asset turnover ratio, employee productivity, solvency ratio, company size expressed as total assets and age. They employed the method of multiple regression and showed that profitability was positively influenced by the cash flow to revenue ratio, solvency ratio and asset turnover ratio. Company size had a negative impact on profitability while labour productivity and age had no significant influence on it. Šteko (2020) analysed how the gender structure in managerial positions in the 400 largest companies in the Republic of Croatia influenced business performance. For the purpose of her study, she used return on assets as the dependent variable while the share of women on boards of directors, the share of women on supervisory boards, the Blau index for female representation on boards of directors and the Blau index for female representation on supervisory boards were used as the independent variables. She introduced total assets, company debt, current liquidity, asset turnover ratio and financial strength as the control variables. The results showed that total assets indicator, debt, current liquidity and financial strength had a statistically significant impact on

return on assets. In addition, the study found that gender diversity within boards of directors had a statistically significant impact on business performance. Džanić (2012) analysed the relationship between ownership structure and performance indicators on a sample of companies listed on the Zagreb Stock Exchange in the period from 2003 to 2009. As an indicator of performance, he employed return on assets, Tobin's Q and labour efficiency. The control variables he used were leverage, the share of intangible assets in total assets, a binary variable which takes value one if a foreigner or a foreign company are owners of more than 20 % of the company's equity, and a binary variable which takes value one if the company was established before 1991 and has, at least partially, gone through the process of privatisation. He also introduced variables for the type of ownership, according to which he differentiated a family, a company, the state and financial institutions as types of owners. The results of the research indicated that the existence of a large shareholder had a negative impact on Tobin's Q value and no influence on return on assets and labour efficiency. Moreover, the presence of the second largest shareholder did not affect performance if the owner was not a family and/or an individual. The presence of a family as the second largest owner had a significant and positive effect on the value of Tobin's Q. Management ownership had a negative effect on labour efficiency but no effect on return on assets and the value of Tobin's Q. Foreign ownership either had a negative impact or no significant effect on business performance in the study. Al-Jafari and Samman (2015) investigated the determinants of profitability based on the data for companies listed on the Muscat market by using a panel data model. They used profit margin and return on assets as a measure of profitability. The independent variables in their study included the average tax rate, size, fixed assets, working capital and the debt to assets ratio. The study showed a significant positive relationship between profitability and size, growth, fixed assets and working capital. On the other hand, there was a negative relationship between profitability and the tax rate and the debt to assets ratio. Agiomirgianakis, Voulgaris and Papadogonas (2006) identified the financial factors affecting profitability and employment growth based on the data for Greek manufacturing companies. They conducted the research by using panel analysis encompassing 3094 companies in the period from 1995 to 1999. The independent variables they used included deflated sales growth, gross investment in fixed assets, debt to assets ratio, size, age, exports, liquidity, capitalisation rate, efficiency of the company with respect to the industry, and location. Size, sales growth and an efficient management of assets positively affected profitability. In contrast, profitability was negatively affected by the variables age, exports, debt to assets ratio, capitalisation rate, liquidity and fixed assets investment. Eljelly (2004) examined the relationship between liquidity and profitability by using regression analysis. She observed the variables net sales, total assets, cash conversion cycle in days, current ratio, logarithm of net sales, logarithm of total assets, percentage values of cash conversion cycle and net operating income. The author studied the effect of these variables on a sample of 29 companies from Saudi Arabia. Her study found that there was a negative relationship between liquidity and profitability and that profitability was mostly affected by current liquidity.

### 3. RESEARCH METHODOLOGY

The object of this study was to analyse whether the ownership of pension funds influences the performance of the companies in which they invest. Therefore, the following hypothesis was formulated:

*H<sub>1</sub> = Pension fund ownership influences the performance of the companies in which they invest.*

In order to conduct this research, panel data, i.e., longitudinal variables encompassing both a spatial and temporal dimension was used.

More precisely, the research employed a static panel data model. A sample of 52 Croatian companies selected according to the listed criteria represents the spatial dimension, whereas the temporal dimension refers to the observations in the time horizon from 2015 to 2019. The analysis was conducted in the eViews software. In order to investigate the impact of pension fund ownership on business performance, return on assets was used as the dependent variable, the fraction of shares owned by pension funds represented the independent variable while profit margin and total asset turnover ratio were used as the control variables. The data on the authorised capital and other data necessary to calculate financial indicators were obtained from the financial reports available on the web pages of companies and the Zagreb Stock Exchange. The data on the number of stocks necessary to calculate the ownership share were obtained from the half-yearly financial reports of the mandatory pension funds available on their web pages. Return on assets was used as a performance indicator because it was most often used in the previous studies which the authors examined in order to conduct this research. It is considered that return on assets is an adequate performance indicator since it shows how effectively the management of a company manages assets in order to gain profit (Knežević, 2015) and it is a useful tool for comparing previous results of companies (Šteko, 2020). Profit margin was selected as the control variable because it is associated with the profit that owners retain and it is often used in analyses conducted by both institutional investors and companies for the purpose of gauging the financial health of a company, recognizing growth potential and comparing a company against its competitors (Segal, 2020). Total asset turnover ratio was chosen as the control variable because previous studies indicate its importance for investors, i.e., pension funds in this case. If the companies whose shares they own have a high total asset turnover ratio, it means that they earn higher incomes with fewer investments, which consequently leads to higher returns for pension funds (Knežević, 2015). Table 1 provides descriptive statistics of the research variables.

	ROA	PF	PM	ATR
Mean	0.024063	0.148218	0.328555	0.557547
Median	0.030000	0.100000	0.070000	0.370000
Maximum	1.560000	0.890000	19.04000	2.340000
Minimum	-2.010000	0.000000	-2.840000	0.000000
Standard Deviation	0.199576	0.165877	1.991344	0.503987
Skewness	-2.495988	1.795408	7.527083	1.448549
Kurtosis	59.89783	7.045942	64.11112	4.550328
Jarque-Bera	34797.68	246.3019	42252.77	95.37080
p-value	0.000000	0.000000	0.000000	0.000000
Sum	6.160000	29.94000	84.11000	118.2000
Sum Sq. Dev.	10.15677	5.530558	1011.190	53.59452
No. of Observations	256	202	256	212

*Table 1: Descriptive statistics of research variables  
(Source: Created by the authors in eViews)*

The temporal dimension of this study refers to the observations of the variables in the period from 2015 to 2019. The reason for the relatively short time period lies in the fact that three categories of mandatory pension funds were established in 2014 instead of just one that existed until then (Mandatory Pension Funds Act (Official Gazette 19/2014)). In order to examine the impact of the ownership of pension fund on business performance, the portfolios of four mandatory pension funds in categories A and B were observed for 2015, 2016, 2017, 2018, and 2019. The portfolios were used to make a list of 60 companies that are included in their portfolios. Category C pension funds were not included in the sample; given that they do not invest in stocks of Croatian companies.

The following criteria were taken into account when selecting the sample: (1) the financial reports for the period during which they were included in the portfolios of the observed pension funds are available, (2) the issuers of stocks are not in the financial sector, (3) the issued stocks are common stocks. The following companies did not meet the criteria and were excluded from the sample: The Garden Brewery, Modra Špilja and Vis, whose financial reports were not available, Hrvatska poštanska banka, Privredna banka Zagreb, Quaestus nekretnine, Zagrebačka banka and Zagrebačka burza, which are all financial institutions. The final analysis includes 52 companies, listed in alphabetical order in Table 2.

A - Hr	Ht - L	M - Z
AD Plastik, Adriatic Croatia International Club, Adris grupa, Arena Hospitality Group, Atlantic grupa, Atlantska plovdba, Auto Hrvatska, Čakovečki mlinovi, Dalekovod, Dukat, Đuro Đaković Holding, Ericsson Nikola Tesla, FTB Turizam, Granolio, Helios Faros, Hoteli Brela, Hoteli Makarska, Hrvatski telekom,	HTP Korčula, HTP Orebić, HUP Zagreb, Ilirija, Imperial, INA, Ingra, Institut IGH, Jadran, Jadranski naftovod, Jamnica, Končar, Končar – distributivni i specijalni transformatori, Ledo, Liburnia Riviera Hoteli, Luka Ploče, Luka Rijeka	Magma, Maistra, Meritus ulaganja, Metronet telekomunikacije, Optima telekom, Petrokemija, Plava laguna, Podravka, Professio energia, Saponia, Stanovi Jadran, Sunce Koncern, Tankerska Next Generation, Turist hotel, Uljanik, Valamar Riviera, Viro tvornica šećera.

Table 2: Alphabetical order of companies in sample

(Source: Created by the authors based on the data on the portfolios of mandatory pension funds)

Based on the defined hypothesis and selected variables, an econometric model was formulated as follows:

$$ROA_{i,t} = \alpha_i + \beta_1 \%PF_{i,t} + \sum_{k=2}^2 \beta_k * control\ variables_{i,t} + \varepsilon_{i,t}$$

$$\sum_{k=2}^2 \beta_k * control\ variables_{i,t} = \beta_2 PM_{i,t} + \beta_3 KOI_{i,t}$$

$ROA_{i,t}$  – return on total assets of company  $i$  period  $t$

$\%PF_{i,t}$  – fraction of shares owned by institutional investors in company  $i$  period  $t$

$PM_{i,t}$  – profit margin of company  $i$  period  $t$

$KOI_{i,t}$  – total asset turnover of company  $i$  period  $t$

$i = 1, \dots, 52; t = 1, \dots, 5$

where

$N$  represents the number of observations,  $T$  represents the number of time periods,  $\alpha_i$  represents the intercept of the model,  $\varepsilon_{i,t}$  represents the residual error, and  $\beta_1, \dots, \beta_k$  represents the regression coefficients.

The model assumes that  $\alpha_i$  are random variables independently and identically distributed across units with mean 0 and variance  $\sigma_\varepsilon^2$ ; and that  $\varepsilon_{it}$  are random variables independently and identically distributed across units and time periods with mean 0 and variance  $\sigma_\varepsilon^2$  (Glaudić Mekinić, 2016).

#### 4. RESEARCH RESULTS

A static panel data model was used in the research to identify the impact of the ownership of pension funds on business performance as measured by return on assets (ROA). The results are presented in Table 3. The results of the F-test, LM test and Hausman test showed that the random-effects model was more appropriate than the fixed-effects model and pooled OLS.

Dependent variable Return on Assets (ROA) (i,t)	Coefficient	p-value
Intercept $\alpha_i$	0.013921	0.2596
Ownership Share of Pension Funds (%PF)	0.064867	0.1009
Profit Margin (PM)	0.006806	0.027
Asset Turnover Ratio (ATR)	0.03926	0.0024
F-test		0.0000
LM test		0.0936
Hausman test		0.3134
Selected model		RE
No. of Observations		202

*Table 3: Results of the static panel analysis of the impact of pension fund ownership on business performance*  
(Source: Created by the authors in eViews)

The results provided in Table 4 indicate that the ownership of pension funds has a statistically significant impact on the performance of companies in which they invest at significance level 5 %. The reason for this is the creation of a more secure framework for achieving long-term goals. According to the Ordinance on permitted investments and additional investment limitations relating to mandatory pension funds (Official Gazette 2/2020), pension funds are obliged to take into account the long-term nature of their investments and acquire transferable securities in compliance with the fund's investment principles, strategies and goals. It is therefore evident that is in pension funds' interest that large companies in which they invest have a positive impact on the value of the fund's assets. Pension funds attend general meetings of companies due to their ownership share and therefore participate in decision-making regarding the companies, e.g., election of board members, allocation of the realised profit, mergers with other companies. In particular, they are granted this power when their ownership share in large companies surpasses 10 %, according to the Rules for Corporate Governance and Dealings with the Issuer. According to the available Rules, pension funds state that they are driven by the goals of their investment policy, which is to increase the value of the fund in order to pay retirements to their members, when they vote on decisions in general meetings of issuers (AZ - Rules for Corporate Governance, no date - Podravka, no date, PBZ Croatia Osiguranje d.d., 2020, Rules for Corporate Governance and Dealings with the Issuer – Dalekovod Profesio d.d. | Erste Plavi, no date, RMD - Rules for Corporate Governance - HUPZ, no date). According to the presented results, the hypothesis H1 = Pension fund ownership influences the performance of the companies in which they invest was accepted with a 95 % confidence interval.

#### 4.1. Limitations of the Research

A limitation of this study includes a sample consisting of only mandatory pension funds as a basis for investigating their influence on business performance. It is proposed that further research include voluntary pension funds as well. Moreover, an alternative measure of performance may be used instead, e.g., Tobin's Q or return on equity, and a study on the impact of pension fund ownership on business performance may be conducted by using these indicators. Another limitation includes the choice of panel analysis as the method of this study. The method itself has its own limitations, for example: data collection problems arising from the fact that the data were incomplete, i.e., financial reports of some companies were not available; selectivity problem as a result of financial statements missing the necessary information for the observed period; and the time series dimension, for which the input data were collected in different time intervals.

#### 5. CONCLUSION

A detailed study of previous research about the determinants of business performance provided the foundation for investigating the impact of pension funds on the performance of large companies. The empirical research presented in this paper shows a statistically significant impact of pension funds on business performance as measured by return on assets (ROA). The results show a positive impact, which is an indication of an aggressive asset management style resulting from a highly competitive market, and naturally investment funds seek to fulfil the obligations they have towards their own shareholders, i.e., stakeholders. Their goal is to generate profits for their own firm that manages the assets, and the profits come from the investors who make deposits into funds. The more attractive a fund is and the more income it earns, the higher its profit will be. Previous research has shown that pension funds tend to engage more in the process of corporate governance, as their fund managers mostly make decisions on long-term investments, prefer to keep the asset turnover at lower levels, and hold shares in their portfolios longer than other institutional investors. This is because it is easier for these institutional investors to predict and monitor the time horizon of payments, i.e., the drain of their members' capital, which facilitates long-term investing. By engaging in corporate governance, pension funds fulfil both their ethical and fiduciary duties. Consequently, they also fulfil a far more important role that entails an effective capital allocation and the monitoring of operations, which directly leads to the fulfilment of their primary duty – maximization of shareholder wealth.

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## EUROPEAN PERSPECTIVE OF THE WESTERN BALKANS: INCREASING GEOPOLITICAL STABILITY THROUGH ECONOMIC AND INSTITUTIONAL DEVELOPMENT

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### ABSTRACT

*The former communist countries of Central and South-Eastern Europe at present are mostly NATO/EU member states. The Western Balkans have a European perspective. However, the economic situation in the Western Balkans is not optimistic, with bleak prospects for rapid economic development. The GDP per capita of the “most developed” Western Balkans state (Montenegro) is still lower than the GDP of Bulgaria, the least developed EU member state. It is not likely that the investment boom and GDP growth experienced in the Visegrad Four and Baltic States in the pre-accession period will be repeated. Demographic challenges in some of the Western Balkans countries are staggering (as well as in the Baltic States, Romania, Bulgaria, Hungary, and Croatia). With the possible accession to the EU, the emigration from the Western Balkans countries would most likely increase due to the opening of the labour market in the EU member states. If socio-economic development is not comprehensively encouraged, substantially financed and meticulously audited by the EU, poor economic results and negative demographic impacts of the domestic situation will continue, and external players (Russia and China in particular) will continue to strengthen their economic and political influence in the region. The Bulgarian and Romanian presidencies of the EU have put the Western Balkans rather high on the list of EU’s priorities, with the interim Austrian presidency giving support to the faster integration as well. In the first half of the 2020, the Croatian presidency has, considering the geographic proximity, as well as historical experience and contemporary ties of Croatia to the region, continued with putting the issue on the EU’s agenda. What could be the major implications of the accession to the EU for the Western Balkans countries?*

**Keywords:** *The Western Balkans, the European Union (the EU), Russia, China, geopolitics, demographic indicators, economic performance*

### 1. INTRODUCTION

The former communist countries of Central and South-Eastern Europe at present are mostly NATO/EU member states. The Western Balkans countries have a European perspective, stated in various documents of the EU. However, the economic situation in the Western Balkans is not optimistic, with bleak prospects for rapid economic development. The GDP per capita of the “most developed” Western Balkans state (Montenegro) is still lower than the GDP of Bulgaria, the least developed EU member state. It is not probable that the investment boom and GDP growth experienced in the Visegrad Four and Baltic States in the pre-accession period will be repeated. Demographic challenges in some of the Western Balkans countries are staggering (as well as in the Baltic States, Romania, Bulgaria, Hungary, and Croatia). With the possible accession to the EU, the emigration from all Western Balkans countries would most likely increase; hence gradual or instant opening of the EU labour market has been the most significant factor influencing the demographic characteristics of post-communist EU members.

The Western Balkans in the past decade has been experiencing a steady, continuous rise of the non-EU, non-Western originated external influence. Numerous evidences to support this claim can be found in the intensity of activities from major non-EU, non-Western actors, mainly Russia, China, and Turkey. The connections that have been intensified are visible in the area of political connections and alliances, military ties (such as for example the procurement of Russian weapons from Serbia), and economic ties (Russian, Chinese and Turkish investments in several countries of the region, with the focus on Serbia, Montenegro, and Bosnia-Herzegovina). Although the accession of Montenegro to NATO has shown that the West still considers the Western Balkans as a region of importance, with the accession of North Macedonia to the Alliance confirming the thesis, the influence of non-EU, non-Western aforementioned major players should not be disregarded and certainly will not cease. Consequently, if socio-economic development in the Western Balkans is not comprehensively encouraged, partially financed and meticulously audited by the EU, poor economic results and negative demographic impacts of situation within the state will continue, and external players (Russia and China in particular) will continue to strengthen their economic and political influence in the region, bringing the importance role of geopolitics and geo-economics in the Western Balkans, a region that might be at its crossroads. It will either continue its path towards the EU, or it will become, or at least some of its countries will, more similar to the European Neighbourhood countries, with powerful and rising non-EU external influences, originating from Russia, Turkey, and China. Therefore, it is the main intention of this paper to show the perspectives of external influence in the Western Balkans on the perspectives of the region's European integration – and to answer the question whether the EU's policy of conditionality, if modified, would bring the countries closer to the EU, concurrently drawing them away from the already mentioned non-Western, non-EU actors that are active in the Region.

## **2. GEOPOLITICAL TENSIONS IN THE WESTERN BALKANS: A FACTOR THAT HINDERS THE EUROPEAN INTEGRATION BUT COULD ACCELERATE IT**

The distinction between the "Western Balkans" as an unstable area of most of the former Yugoslavia, including Albania, and other parts of the Balkans, where conflicts lasted or had just ended, and the prospect of a path to European and Euro-Atlantic integration was almost non-existent in the mid-1990s and remains present in political and geopolitical discourse to this day. The term "Western Balkans" started to be used as a label for the area of the former Yugoslavia, plus Albania, minus Slovenia (which early found the right path towards European integration and became the most successful transition country). The credit for the emergence of the term actually goes to the EU's policy towards that area, primarily referring to the former Yugoslavia, after its disintegration in 1991. With the separation of Slovenia from the wars in the former Yugoslavia, the territorial scope of the term was narrowed, but at the same time enlarged Albania, especially after the unrest in Albania in 1997. In political terms, the term "Western Balkans" was developed into a concept after 1997, and in official documents of the EU, following the establishment of a special regional commission of the Council of Ministers of the Union for the Western Balkans<sup>1</sup>. From all the mentioned reasons, it is very important to delimit and understand that since the start of the former Yugoslavia's breakup there are actually two Balkans, as Metushaj (2018: 142) states "Since 1990, in the Balkans we have almost "two Balkans". The successful Balkans in the process of Euro-Atlantic integration and the unintegrated or semi-integrated Balkans. The integrated Balkans is the eastern and southern part, while the unintegrated Balkans is the Western Balkans, exactly that part of the region where Albania, Montenegro, Bosnia-Herzegovina, Serbia, Kosovo and North Macedonia are located.

<sup>1</sup> European Commission trade policy, Western Balkans, <http://ec.europa.eu/trade/policy/countries-and-regions/regions/western-balkans/>

So, it is not the geographical position that gives the name to this region, but the need for an essential distinction of countries in this part of the Balkans, to give a politically correct name to a subregion that is not Yugoslavia or Albania anymore, but in fact nowhere else”. From the geographical and geopolitical point of view of this “post conflict area”, the most correct is to name it the Western Balkans. The fact is the further strengthening of ethno-nationalisms and continuous straining of bilateral relations: “Since the introduction of multi-partisan political systems in the early 1990s, the WB have experienced a variety of ‘hybrid regimes’ (Collier and Levitsky, 1997) falling in the wide spectrum between consolidated democracies and autocracies, yet never reaching the standing of fully consolidated liberal democracies” (Kmezic, 2020: 1). It is widely believed that all the mentioned problems from the perspective of the Western Balkans countries should be solved with their full EU membership. On the other hand, the EU, if it wants to maintain political and economic supremacy in this part of Europe, must seriously draw up a new, wider access strategies for countries that aspire to EU membership. “Enlargement is considered to be the EU’s most efficient foreign policy instrument in terms of its ability to transform existing practices and institutional structures outside of its borders. Less is known about how it works on the ground in specific contexts. Despite high leverage at the general level and the efforts of monitoring, for example through the meticulous assessment in the Commission’s annual progress reports, a large part of the enlargement literature shares the view that the EU’s record in spreading human rights and democratic norms in a credible and effective fashion during the accession process is mixed at best” (Huszka and Körtvelyesi, 2017: 4). “Political conditionality is the major instrument through which the EU has sought to foster democratic reforms in the Western Balkans. The strict application of ‘carrots and sticks’ with the membership perspective at its core yielded major steps forwards, confirmed not least by Croatia’s accession to the EU in July 2013<sup>2</sup>. Still, the EU has not been able to reproduce its success story from the Central and Eastern European (CEE) enlargement in the Western Balkans” (Richter and Wunsch, 2020: 41-42). As far as the general public opinion is concerned According to Jovic (2018: 6, 15-17), there is “an open rejection of pro-EU policies by significant segments of public opinion in Serbia and in the Republic of Srpska, Bosnia-Herzegovina. On the contrary, there is much enthusiasm and support for the West in general and the EU in particular in predominately non-Slavic countries, Kosovo and Albania.” To this we can also add the overwhelming affections for the separation from Bosnia-Herzegovina, de facto the end of this state as such, that exist among the Bosnian Serbs, as well as, although not so expressed, among the Bosnian Croats. These separatist tendencies ultimately would (de facto if not de iure) result in the unification of the Republic of Srpska with Serbia, and the Croat-dominated parts of Bosnia-Herzegovina with Croatia. Due to inability to pursue these goals, the political elite of Bosnian Croats has opted for the next best thing – the accession of Bosnia-Herzegovina to NATO and to the EU, which would lower the sense of endangerment and frustrations that arise from the majorization from the Bosniaks in the Federation of Bosnia-Herzegovina. Although the visions for the future of Bosnia-Herzegovina of the leaders of Bosnian Serbs and Croats are very different, if not totally opposing, they agree on one thing, and that is the opposition towards any centralization of the state. In this particular case, the rule “an enemy of my enemy is my friend” again verifies itself, this time producing a geopolitical tension including the external and internal political instability. Present-day Bosnia-Herzegovina, considering the way it is now constituted and governed, is a state in which the majority of two (Croats, Serbs) out of total three constituent nations do not want to live.

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<sup>2</sup> Schimmelfennig and Sedelmeier (2019) have developed the External Incentives Model (EIM), in order to explain the Europeanization of the Central and Eastern European countries (CEECs) through the EU’s accession conditionality. The authors have also applied the Model to study the EU’s impact in two additional contexts: post-accession developments in the CEECs and the Southeast European countries currently in the accession process. The authors state that the credibility of incentives stands out as a crucial condition for the success of EU conditionality.

It is a reality that produces political tension and instability, which immediately and without any doubt includes neighbouring countries Croatia and Serbia, therefore producing geopolitical instability that threatens the stability of a significant part of the Western Balkans, and includes one EU member state as well. Bosnia and Herzegovina is characterized by a complicated political system, a bloody history, a lack of will, vision and determination by the ruling political elites in all three constituent peoples for progress. The citizens of both entities (the Federation of Bosnia-Herzegovina and the Republic of Srpska) resigned and lethargic because the standard of living is falling, reforms are being implemented poorly, power for months after the election does not constitute, nor no responsibility or rebellion to the public or the reactions of citizens and non-governmental organizations of the fact. Another problem is the large emigration from Bosnia-Herzegovina, especially of young and educated people. Since the 1991 census, about 1.5 million citizens have left Bosnia-Herzegovina or have been forced to leave. Despite the difficult economic and social situation things further complicated by constant political crises that block the progress of the country. The popularity of the EU in Serbia has declined since most of the EU member states recognized Kosovo in 2008 and 2009. If one analyses further the results of recent public opinion polls in Serbia, one can conclude that Kosovo represents the key red line in public perception of Serbia's relationship with the EU. Furthermore, it is used by conservative, pro-Russian forces to pressurise government into a more cautious policy on Europeanisation (Jovic, 2018: 21). Concurrently, Russia and China, as desired allies, enjoy high levels of popularity. Pejovic (2018: 87) emphasizes a clear pattern of connection between respective external influences and their counterparts – allies in the region. Consequently, the Russian influence in the Western Balkans is dominant in the countries with a majority of Orthodox (Serbian and Montenegrin) population, and not so much in North Macedonia. Nevertheless, Montenegro has broke from that influence with its accession to NATO, and therefore trying to limit the influence of Russia to the economic sphere. As the country is expected to proceed towards the membership in the EU, Russian economic influence should also become relatively smaller. Nevertheless, the current government is not so pro-NATO as the former one. It is highly doubtful that if this government was in power a couple of years ago, would it pursue NATO membership. Pejovic also discusses the influence of official Turkey i.e. Ankara on Albania, Kosovo and especially Bosniak controlled part of Bosnia-Herzegovina. The abandonment of Turkey (and the pursuit of Neo-Ottomanism agenda) of the path that led to a possible future EU integration also brought in a new element in the relations between Turkey and the Western Balkans.

### **3. THE DIALECTIC RELATION BETWEEN ECONOMIC DIFFICULTIES AND DEMOGRAPHIC CHALLENGES IN THE WESTERN BALKANS COUNTRIES**

The demographic exodus from the Western Balkans, present and future, is a reality, which will only be more serious, considering the region's economic stagnation and backwardness, compared to the EU (even to the most its post-socialist members) and the lower level of wages, higher level of corruption and nepotism (clientelism), and social insecurity (all these parameters have to be compared with the EU in general and especially its most developed member states). This more recent demographic exodus is, unlike in the 1990's, when it was a consequence of wars, a result of poor economic performance of the Western Balkans countries, which in that sense resemble their neighbour countries, Romania, Bulgaria, and Croatia (and these three countries are much more alike and more similar to the Western Balkans countries than they are to other EU member countries, when it comes to economic performance, developmental perspectives, corruption of the public sector etc.).

*Table 1: GNI per capita, PPP (constant 2017 international \$) of the post-socialist EU member states and the Western Balkans states in 2008 and 2019*

State	2008	2019	Index 2019/2008=100
<b>Bulgaria</b>	16 907	22 793	134.8
<b>Croatia</b>	24 593	28 164	114.5
<b>Czech Republic</b>	32 605	38 351	117.6
<b>Estonia</b>	28 199	36 094	128.0
<b>Hungary</b>	24 371	32 064	131.6
<b>Latvia</b>	24 409	30 445	124.7
<b>Lithuania</b>	26 004	35 944	138.2
<b>Poland</b>	22 088	31 913	144.5
<b>Romania</b>	21 591	29 507	136.7
<b>Slovak Republic</b>	25 723	30 331	117.9
<b>Slovenia</b>	35 292	38 461	109.0
<b>Albania</b>	10 163	13 588	133.7
<b>Bosnia and Herzegovina</b>	11 467	14 904	130.0
<b>Kosovo</b>	8 261	11 629	140.7
<b>Montenegro</b>	17 570	21 489	122.3
<b>North Macedonia</b>	12 826	14 914	116.3
<b>Serbia</b>	14 257	17 244	120.9

*Source of data: World Bank Country Indicators*

*Table 2: GNI per capita 2019, PPP (constant 2017 international \$) of the most desired European countries of economic migrants from the post-socialist Central and South-East European countries (EU and non-EU member states)*

Country	GNI per capita, PPP (constant 2017 international \$)
<b>Austria</b>	56 463
<b>Germany</b>	55 015
<b>Ireland</b>	65 762
<b>Sweden</b>	54 575
<b>Switzerland</b>	66 046
<b>United Kingdom</b>	45 870

From the previous two tables, it is clear that the difference in GNI per capita, as one economic indicator given here, is still sufficient enough, especially between the Western Balkans countries and the countries from Table 2, to boost out migration from the region. There are of course additional factors that are fuelling this trend – pre-COVID-19 crisis relative abundance of jobs in these countries compared to the relative number of jobs in the home countries of the migrants, better social and health security for the families, better social climate. Due to economic difficulties and social injustices (corruption, nepotism, clientelism, criminally-led privatization of state property etc.) that are causing this massive demographic exodus, compensatory mechanisms for avoiding a total demographic disaster and thereby giving a region at least some economic and in general social perspective, provided by the EU in pre-accession and post-accession period, should be implemented as soon as possible. Cohesion policy of the EU will not suffice in dealing with this long-term structural problem. These compensatory mechanisms should be targeted, comprehensive, rationalized and rational, addressing the most vulnerable groups in the societies and giving them incentives to stay in their home countries.

The Western Balkans countries are clearly not capable, nor will they likely be, to perform these measures alone, and it can be fairly said that the experience of the Baltic States, as well as Croatia, Bulgaria, and Romania, shows that these countries, most of which are small or medium-sized (except Romania) and vulnerable, were and still are unable to cope with this demographic exodus.

*Table 3: The population, total population change, and net migration of the post-socialist EU member states and the Western Balkans countries 1988-2019*

Post-socialist EU member state	Population, thousands, 2019	Population, thousands (peak year)	Total demographic loss, peak year – end of 2019, thousands (percentage)	Net migration, 1988-end of 2017
<b>Bulgaria</b>	6 976	8 981 (1988)	-2 005 (-22.3)	-732 034
<b>Croatia</b>	4 068	4 780 (1990)	-712 (-14.9)	-457 563
<b>Czech Republic</b>	10 670	/	/	604 343
<b>Estonia</b>	1 327	1 569 (1990)	-242 (-15.4)	-181 700
<b>Hungary</b>	9 770	10 712 (1981)	-942 (-8.8)	355 278
<b>Latvia</b>	1 913	2 667 (1989)	-754 (-28.2)	-529 670
<b>Lithuania</b>	2 787	3 704 (1991)	-917 (-24.8)	-779 379
<b>Poland</b>	37 971	38 660 (1999)	-689 (-1.8)	-878 100
<b>Romania</b>	19 357	23 202 (1990)	-3 845 (-16.6)	-3 192 850
<b>Slovak Republic</b>	5 454	/	/	16 806
<b>Slovenia</b>	2 088	/	/	70 944
<b>Albania</b>	2 854	3 287 (1990)	-433 (-13.2)	-1 220 373
<b>Bosnia and Herzegovina</b>	3 301	4 508 (1988)	-1 207 (-26.8)	-1 220 310
<b>Kosovo</b>	1 794	2 086 (1997)	-292 (-14.0)	n/a
<b>Montenegro</b>	622	/	/	-58 431
<b>North Macedonia</b>	2 083	/	/	-145 928
<b>Serbia</b>	6 945	7 735 (1994)	-790 (-10.2)	-880 269

*Source of data: World Bank Country Indicators*

It is visible from Table 3 that more than half of the post-communist EU members are facing serious demographic challenges, with the Western Balkans countries facing mostly similar challenges, with North Macedonia and Montenegro as the hitherto exceptions. In the Baltic States, the influence of de facto decolonization, resulting in the beginning of the return of significant portions of Russian populations back to Russia. Besides these processes that are a result of historical events and had nothing to do with the accession to the EU, gradual or instant opening of the EU labour market (depending on the decisions of the particular EU member states after the EU enlargements of 2004, 2007, and 2013, respectively) has been the most significant factor that influences the demographic characteristics. With the possible future accession to the EU, the emigration from all Western Balkans countries will probably increase, if these countries will follow the path of the post-communist EU members, hence gradual or instant opening of the EU labour market has been the most significant factor that influences the demographic characteristics of the post-communist EU members. The second factor, with primarily economic implications (besides the EU accession) that has negatively influenced the demographics of the analysed countries was the Great Recession that hit the Baltic States the worst (in the most challenging year for the economies, 2009) and Croatia the longest. In 2007, the Western Balkans countries joined the Central European Free Trade Agreement (CEFTA): “Western Balkans countries have some comparative advantages for a range of their products and services that could penetrate EU markets and beyond.

However, they still need to improve their productivity by investing in skills and new technology and to accelerate their exports by introducing new products and following external market trends. The recent trade data suggest that some WB countries expanded their market shares in the EU, of which Serbia and Bosnia and Herzegovina benefited the most due to their larger production base, followed by North Macedonia, whereas the other three countries lagged behind. Yet, despite recent expansion of exports, the WB countries remain poorly integrated into EU market” (Qorraj and Jusufi, 2018: 56). According to *Emerging Europe* portal “In Central Asia and Eastern Europe, slowing activity in Russia could reduce remittances, which account for an important portion of income in countries including Moldova and Ukraine. In Europe and Central Asia, worsening demographic trends – including the shrinking size of the working-age population – add to these challenges.” More than just sheer numbers on population loss, the data on “brain drain” show even bleaker perspective for most of the Central European post-socialist countries as well as for the Western Balkans countries: “55% of people with higher education from Bosnia and Herzegovina live abroad, and this figure is over 40 % of the educated populations of Armenians and Latvians, and close to 40% for Albania, Moldova, North Macedonia and Romania.”<sup>3</sup> Unfortunately, rather non-impressive economic results of Croatia are more comparable to the ones of the Western Balkans countries and Bulgaria than to the other post-socialist EU member states, and are therefore increasing the demographic outflow of the most productive parts of the population. Also, demographic issues will haunt the Western Balkans in the long-term period, same as they haunt post-socialist EU members. It is necessary to scrutinize the experience of Croatia, as the most recent EU member state, regarding demographic and economic issues after its accession to the EU, as a precursor for the Western Balkans countries. As the previously presented statistics shows, for Central European post-socialist countries, approaching the EU meant an imminent, significant increase in the GDP per capita, FDI and other important economic indicators. However, this integration was done in a different period, before the Great Recession. Substantial problems with the integration to the EU surfaced in the cases of Bulgaria and Romania, which were put under close monitoring due to low transparency of EU funding spending. Due to previous experience and increased enlargement fatigue, Croatia faced higher criteria for membership, and all its chapters had benchmarks.

#### 4. CONCLUSION

The Western Balkans are of less relevance to the EU than they were 10 or 15 years ago, due to internal problems of the EU and the “enlargement fatigue”. The Western Balkans are at a certain dividing line, whereby it can either really and not only declaratively continue its path towards European integration or have only a declarative perspective, and in reality, be in a similar position to the Eastern Partnership countries, with up to a certain point developed relations with the EU, but without a real membership perspective. The arguments for the EU membership based solely on the fact that if the EU does not admit the Western Balkans countries, external players will exert greater influence are not correct, hence the impacts already exist and the Western Balkan countries are not strategically important enough to just for that reason admitted to membership. Especially hence when it comes to strategic concerns, NATO is already present through full membership of Albania, Montenegro, and North Macedonia and the membership of all countries that surround the Western Balkans region. Support to NATO membership of Kosovo is very high, and Bosnia-Herzegovina has, with the acceptance into the NATO’s Membership Action Plan (MAP) made a step further towards full NATO membership. Therefore, Serbia remains the only state that is firmly opposed to NATO membership and declares itself as neutral in military terms.

<sup>3</sup> <https://emerging-europe.com/business/migration-raises-brain-drain-concerns-for-many-cee-countries-as-regional-economy-slows/>.



Nevertheless, due to NATO's presence and encirclement of the region with NATO member states, the spread of possible conflicts and the impact of outside influence are still limited. However, that does not exclude the fact that relevant geopolitical tensions exist in the region, primarily resulting in the fact that the Western Balkans today are much more threatened by the implosion and the fall into irrelevance for Europe regarding the processes of the European integration (this has already happened in a certain way) than by the spread of conflict across the whole or even less likely, outside the region. The region faces a serious jeopardy of being left outside the door of the EU, at least by the end of the current decade. The possibility that in 2030 all of the Western Balkans countries will still not be EU member states does not seem vague. It seems rather realistic. The conditionality in the process is necessary but it is doubtful will it help or it will simply hinder the process further: "Since the enlargement process of Central Eastern European countries, conditionality started to be shaped as a tool for the accession process of the target state, with the aim of transforming the governing structures, the economy and the civil society of the (potential) candidate countries. In the broader sense this meant to be a strategy in which a reward is either granted or withheld depending on the fulfilment of an attached condition" (Rushaj, 2015: 468). This basically points us to the systems of rewards and setbacks in the process of pre-accession of the Western Balkans to the EU. Petrovic (2020), mentioning "sticks and carrots", suggests a possibility that the reasons why post-communist transformation in the Western Balkan countries has been less successful—although these countries have also received the EU's invitation for accession, do not primarily stem (as often emphasised by EU officials and some scholars) from the structural inabilities of the Western Balkan countries to adopt the EU's values and norms, but rather from inconsistencies in the accession conditions and some EU policy incentives towards these countries. In the Western Balkans, regional integration is not showing in a pace and amount that could guarantee that the region will not again be dragged into conflicts, and the influence of external (outside EU) players is continuously strong. All of this means that the region needs to be supported, monitored and fostered by the EU in its way to more stability and prosperity. Naturally, much of these future possibilities also depend on the will of the people and the results of the elections in the respective countries of the region, hence these will also be real indicators of the path that the societies want to take and of the real willingness and preparedness for the reforms, which cannot and should not be imposed only from Brussels.

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## THE TEACHING OF CORPORATE SOCIAL RESPONSIBILITY (CSR) IN BUSINESS SCHOOLS (BS): A REVIEW OF THE LITERATURE

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### ABSTRACT

*This article presents how the teaching of corporate social responsibility (CSR) has been studied throughout the world over the past five years through a systematic review of the literature. Four main categories have been gleaned from an analysis of selected articles: student and professor perceptions of the teaching of CSR, the teaching methodologies used by professors, CSR's context within class syllabuses, and the way that business schools (BS) have treated this subject. Students consider this subject to be relevant, and they seek preparation in how to deal with CSR issues from BS. However, they perceive little pragmatism in terms of what is taught in terms of the practice of CSR. In addition, professors seek to diversify their teaching methodologies as they adapt existing materials to the reality of their students, while BS seek to incorporate CSR in their courses to meet market demands and to be internationally accredited. In parallel, some of these studies suggest that there is a limitation to the teaching of CSR, which is that the concept is mainly addressed from an Anglo-Saxon perspective using utilitarian logic, which distances it from the culture of many countries, and this inhibits a deep understanding of the recurrent problems of the business world and the practical applications of CSR. The reviewed articles provide a portrait of how CSR is taught throughout the world, including similarities and differences among different countries, but the overall conclusion is that a single way of thinking is a superficial approach to such a complex and relevant subject. New studies about the teaching of CSR can offer a deeper perspective of reality in various countries and the situations faced by business people in real life, as well as new ways of thinking that take into account the complexity that this subject requires.*

**Keywords:** *Business Schools (BS), Corporate Social Responsibility (CSR), Teaching*

### 1. INTRODUCTION

Corporate social responsibility (CSR) is an important pillar of sustainable development debated in academic and business arena. The idea that companies have responsibilities besides profits has existed ever since the beginning of the industrial revolution, but studies has been intensified leading to the construction of pragmatic models such as Carroll's pyramid (1991) and the triple bottom line (Elkington, 1998), which were followed by more structural and critical analyses that considered the role of companies in reducing social inequality, poverty and environmental problems (Prieto-Carrón, Lund-Thomsen & Chan, 2006; Banerjee, 2007). The teaching of CSR is important because managers are trained in business schools (BS) and they ought to have access to this debate in a constant, rigorous, and up-to-date manner. As a contribution to this, some BS are discussing CSR in their programmes and courses (Wright & Bennett, 2011; Demajorovic & Silva, 2012; Hart *et al.*, 2015 and Veloso, 2020). Moreover, BS are institutionalizing CRS with the adoption of the Principles for Responsible Management Education (PRME), which is based on the United Nations' Sustainable Development Goals

(SDG) (Storey, Killian & O'Regan, 2017; Junior & Caldana, 2017 and Oosthuizen, Usher & Nukunah, 2018). Therefore, this study proposes to analyze researches about the teaching of CSR, over the past five years, in BS around the world by a systematic review of the literature. It's expected that the results could contribute to support professors in their pedagogical practices and provide suggestions for further research in the area, illustrating the real practices.

## 2. CONTEXTUALIZATION OF CSR

The first debates about CSR conception starts in the industrial revolution, being highlighted in a second moment, during the 20<sup>th</sup> century, with the occurrence of several corporate scandals in the United States. Due to these events, legal clauses which sought to define limits between profits and company duties began to gain force (Banerjee, 2007). In academic arena, the consideration of social aspects in companies appeared initially in the work of Bowen (1956). In the following years, works of Walton (1967) and Heald (1970) conceptualized CSR, but the concept was consolidated with the elaboration of models which indicated which obligations companies should have in addition to their economic and legal imperatives (Carrol, 1991; Elkington, 1998; Laasch & Conaway, 2015). The effort of structuring the concept and creating analysis models was important to the understanding of the role of companies beyond their economic interests in a broader more global manner. However, the concept still has some gaps and contradictions, given that a vision in which everyone gains and the results are consensual among all the interested parties is disseminated, without addressing the conflicts generated by meeting the interests of the company while maintaining political and social support (Lélé, 1991). In evaluating further, we can perceive that the current definitions of CSR and its models have limitations in explaining its complexity, especially on a local level and in emerging economies, given that they are geared towards problems identified in the developed world. Thus, some authors take a more critical position (Lélé, 1991; Prieto-Carrón, Lund-Thomsen & Chan, 2006; Banerjee, 2007), reflecting about the role of CSR in underdeveloped countries and the companies' responsibilities to reduce inequality and poverty. They also discuss if company initiatives can be considered voluntary, ignoring the mandatory nature of regulatory aspects and even social pressures. The scarcity of more critical debates or publishes outside of the Anglo-Saxon mainstream may represent a limitation to CSR's adoption by corporations in an effective manner as proposed. To Prieto-Carrón *et al.* (2006) and Banerjee (2007) change will only be possible with a renovation of the way in which we think of CSR, considering an in-depth look at the organizational approach and studies that incorporate the comprehension of the ideological and political biases, as well as historical, social and cultural perspectives.

## 3. THE TEACHING OF CSR

It's not simple to identify how to implement CSR in practice, because it's a complex concept and business decisions are made by people, which means that social, cultural and ethical aspects must also be considered. Because of this, it's important that BS provides the teaching of CSR, given that they are responsible for the formation of future managers. Sant'anna *et al.* (2017) approach that BS seek to surpass traditional management models by using innovative forms of teaching, designed to deal with the challenges of constructing a new standard of competitiveness based on sustainability and the valorization of the human element. There are studies that illustrate active methodologies like an usual approach to teach CSR such as Loura (2014), Valdes-Vasquez and Klotz (2011) and Kociatkiewicz and Kostera (2012). At the same time, BS produces scientific research and include CSR in their syllabuses (Wright & Bennett, 2011; Demajorovic & Silva, 2012; Hart *et al.*, 2015; Weybrecht, 2017 and Veloso, 2020) or adopting PRME practices (Storey *et al.*, 2017; Junior & Caldana, 2017; Oosthuizen *et al.* 2018). In addition, with the growing number of students from emerging economies, BS need to reflect on how to teach this subject to include the needs of new markets, thinking about the composition

of the faculty, research areas, and teacher's training (Sant'anna *et al.*, 2017). The study conducted by Srinivasan (2011) in India and Southeast Asia corroborates this aspect in identifying that most of the formal material about CSR has been written by Anglo-Saxon authors or is part of international teaching networks. Within this context, cultural differences are not contemplated, which creates a distance between teaching CSR and the real challenges in this region. The aspects covered by these studies demonstrate that the teaching of CSR is relevant, but there remain challenges in reaching more critical reflections about what to teach, how to teach it, and to whom to teach it, given the cultural multiplicity and individual values.

#### 4. METHODOLOGY AND RESEARCH

This study investigates what has been researched in terms of teaching CSR through a systematic review of the literature over the past five years (2017 to 2021) in the business area. We selected this method because it systemizes, in an explicit and broad manner, studies of a given subject, using a structured and transparent process with reproduceable and verifiable conclusions (Tranfield, Denyer & Smart, 2003; Okoli, 2019). There were selected three research databases with a large repository of publications in this area, all over the world, including Brazil: Scopus, Web of Science, and CAPES Periodicals (a Brazilian database). The search in database was made in December 2021 with keywords "corporate social responsibility" and "teaching". As a result, it was identified 324 titles, considering the articles which were repeated in all three databases. After excluding the repeated material there were left a total of 142 articles. Analyzing the content of these material, some articles were excluded, and the final sample was composed by 72 articles. Forty articles were excluded because they did not concern the teaching of CSR, but instead focused on how it is applied in companies, and thirty documents were case studies. These sample have the average of 14 publications per year, with the years 2018, 2020 and 2021 being the years with the largest number of publications. These articles were from 42 journals and 4 conference annals from 31 different countries. However, despite this variety, there was a large hegemony of articles from the United States (14 articles – 19%), Spain (8 articles - 11%) and the United Kingdom (7 articles – 10). The Asian continent was featured in 9 articles (13%), and Brazil was the country analyzed in 7 articles (10%). Some articles performed a global analysis (7 articles -10%) utilizing a review of the literature. With the analysis of the selected articles, we classified their content into four categories: the perceptions of students and professors about the teaching of CSR (28%), the teaching methodologies used (31%), the presence of CSR in business school syllabuses (15%), and the way in which BS act (26%).

#### 5. ANALYSIS OF THE RESULTS

The articles which deal with the perceptions of students and professors find that the teaching of CSR is relevant (Arsalidou, 2017; Zizka, 2017; Najimudinova *et al.*, 2018; Nobile, Dominguez, Berozonce & Perez, 2021; Smith, Zhu, Smith & Mitcham, 2021), given that its knowledge can improve the development of students (Smith & Lucena, 2018; Claver-Cortes *et al.*, 2020), motivating them and increasing their self-confidence in their abilities in solving problems (Deer & Zarestky, 2017) and questioning anomalies such as corruption (Manning, 2018). In addition, they demonstrated that the presence of CSR in business school syllabuses positively affects the images of these universities and student satisfaction (Salcido, Cardenas, & Valdez, 2019; Phan *et al.*, 2021). However, some authors argued that despite the importance of teaching CSR, there is a feeling that there is a lack of pragmatism in terms of what is taught when students are placed in conflicting everyday situations (Ramboarisata & Gendron, 2019). In a study conducted in India, Jeril, Raj and Joseph (2020) found that the concepts, purposes, and benefits of CSR are not always understood deeply and suggest courses and specific pedagogical tools, such as strategies based on Web 2.0 and social media as corroborated by Rodriguez-Gomez *et al.* (2020).

Some possible causes for these limitations could be the multiplicity of personal values (Seidel *et al.*, 2018) or even factors such as the location of BS or authoritarianism, or the religiosity or individualism of the students, as pointed out by Westerman *et al.* (2020) in a study realized in the Southeast of the United States and Hawaii. Tormo-Carbo, Segui-Mas and Oltra (2018), meanwhile, concluded that there was a difference in the understanding of CSR depending on age and gender in Spain. Professors most agree with the importance of CSR to formal education, however, Varela-Losada *et al.* (2021) identified some skeptical professors in terms of the real effect of teaching CSR, due to factors which influence the practice of what is taught. Some subjects were considered more accessible in terms of teaching others, such as the legal dimension, while the philanthropic dimension presented the greatest resistance (Stadler *et al.*, 2017). At the same time, some authors concluded that the difficulty in relating CSR theory with practice is due to the hegemony of the approach to this subject, based on the Anglo-Saxon paradigm, which makes it difficult to understand the reality of emerging economies and different cultures, such as the studies conducted by Ramboarisata and Gendron in Canada (2019), and Gertschen in Mexico (2017). At the same time, Najimudinova *et al.* 2018 contradict this argument, concluding that Middle Eastern students are conscious of ethical differences from a transcultural perspective, but focused their study on this aspect, emphasizing that the understanding of CSR has a relevant cultural component. The analyzed articles which describe the specific methodologies used in teaching CSR, have been applied by professors in various countries. Active methodologies are represented such as the utilization of case studies, problem-based learning, and project-based learning (Cabedo *et al.*, 2018; Molderez & Ceulemans, 2018; Silva, Azevedo & Araújo, 2018; Montiel *et al.*, 2018; Lopez *et al.*, 2021). Other examples of specific methodologies used to teach CSR have been presented by Burga *et al.* (2017) who emphasized experience based on leadership principles; Amundam (2019) who presented a model made up of strategies such as interviews, business plans, and group analysis; Katz (2021) who held workshops with market professionals; Smith *et al.* (2018) who showed how field work and student interaction with companies can improve their vision of their future functions; and Dyck and Caza (2021) who used exercises which encourage students to think about management using the sustainable thinking approach, searching for objectives featuring non-financial factors. The use of technology was highlighted by the works of Loh and Shaharuddin (2019) which uses a 3D hologram, Gatti, Ulrich and Seele (2019) who utilized games and simulations, Montiel *et al.* (2020) who used mobile apps and Web 2.0 tools, and Galletly and Carciofo (2020) who analyzed discussions in online forums, and Xi *et al.* (2021) who used social media, demonstrating that attitudes towards CSR changed in a group of Chinese students, improving its credibility when they examined its sources of information and the quality of its arguments. Garcia-Rosell (2019), Franco and Garcia-Gordillo (2020), and Ainsworth (2021) have evaluated the discourse about CSR. Garcia-Rosell (2019) demonstrated how discourses restrict certain meanings of CSR through an exercise held with students in a Nordic university, in which the stories of CSR were modified and co-created. Franco and Garcia-Gordillo (2020) emphasized that the neoliberal discourse on entrepreneurship and business ethics can introduce a bias into the real educational objectives of teaching CSR, and recommend the promotion of emancipatory teaching, with a return to precepts of Marxist theories. Ainsworth (2021), meanwhile, used the discourse analysis technique to help students examine abstract and concrete representation and social actors in texts about CSR. Using a more critical pedagogical approach, Dal Magro, Pozzebon and Schutel (2020) worked with transformative learning, developed in a Brazilian educational project, where international students developed a community project in real time with local residents, and Heath, O'Malley and Tynan (2019) proposed a structure for the application of a careful ethical approach. Bean and Dodge (2017) conducted a study in China, and even though they are Americans, they agreed in terms of seeking a differentiated and broader logic which can help productive engagement in social

issues and local environments. Borges *et al.* (2018) stressed that there is a lack of data, information and studies focused on Latin America and Africa, which hinders improvements in CSR practices in these regions. Another group of analyzed articles addressed the composition of course syllabuses (Hirschauer, Jantsch & Musshoff, 2018; Fornes *et al.*, 2019; Bagley, 2020), emphasizing that the presence of CSR in management programs is essential (Gorski, Fuciu & Dumitrescu, 2017; Singh, Bawa & Sharma, 2017, Brunstein, Sambiasi & Brunnquell, 2018; Gersel & Johnsen, 2020). While some authors argue in favor of the interdisciplinarity of CSR, recommending the simultaneous teaching, research, and expansion of CSR, (Bagley, 2020; Adeleye *et al.*, 2020), others believe that CSR needs a specific discipline or program as an approach (Hirschauer, Jantsch and Musshoff, 2018; Fornes *et al.*, 2019; Gomes, Jorge & Eugénio, 2021). According to Crawford *et al.* (2018), the evolution of the teaching of CSR has increased significantly since the creation of PRME, which have been incorporated in globally recognized practical management models such as the SDG (Storey *et al.*, 2017), while to Millar and Price (2018) BS are far from fulfilling PMRE, and only deal with it in a discursive and imaginary fashion, because professors and students suffer from a lack of modern and effective content for teaching the SDG (Glavič, 2020). Within the organizational context, BS seek to act in accordance with CSR principles promoting teaching, research, and expansion. Their forms of action have been analyzed by some (Hassan *et al.*, 2019; Reficco, Jaen & Trujillo, 2019; Fornes, Raja & Zahid, 2020; Slager *et al.* 2020; Aguirre & Lasso, 2021; Maruyama, Issberner & Prado, 2021; Heath & Waymer, 2021 and Zizka, McGunagle & Clark, 2021). Proposals and models for improvement are also presented (Ross, 2017; Storey *et al.*, 2017; Barreiros, 2018; Kouatli, 2019; Raja & Zahid, 2020). To Heath and Waymer (2021), the objective of CSR activities in BS is to raise the functional and moral standards which guide them, and it can improve public opinion internally and externally, positively influencing the performance of the employees and the organization (Adu-Gyamfi *et al.*, 2015). According to Snelson-Powell, Grosvold and Millington (2020), and Ali *et al.* (2021), there is a critique of some BS in terms of their not practicing what they preach, given their sustainability rhetoric. The dissonance between what they publish and what they practice affects their credibility as Miotto, Del-Castillo-Feito and Blanco-Gonzalez (2020) indicate, and this is why there is a great focus on marketing strategies to publicize CSR activities and create a good reputation (Demetriou, Thrassou & Papasolomou, 2018). Snelson-Powell *et al.* (2020) add that there is a certain hypocrisy in BS in terms of CSR, not due to an intentional strategy, but rather the pressure of accrediting agencies which induce the prioritization of CSR requirements before institutions are prepared. To Jerzy, Monika and Anna (2019), CSR is a ghost in these institutions which are only concerned with capitalism. Ross (2017) concludes that a plausible proposal would be if international accrediting institutions increased their demands and accompanied the results of the evolution of the implementation of CSR in BS. Even though accrediting institutions already contemplate these parameters, accreditation is not mandatory, which hinders the standardization of the ways BS act. Another possibility would be communication and the creation of value shared between BS and companies (Kouatli, 2019). However, there is no consensus among the authors, because this would not lead to genuine change, and would occur only when BS cede to external pressures. Slager *et al.* (2020) who studied how research centers for sustainability operate, also agree that despite external pressure, it is still a challenge to incorporate and legitimize CSR practices in BS, as do other studies of this subject.

## 6. FINAL CONSIDERATIONS

This study presents what has been researched about teaching of CSR over the past five years. It demonstrates a worldwide preoccupation with this subject, which even though it is relevant, is still based on an Anglo-Saxon perspective, whose proposed solutions use hegemonic management tools which hinder students from practically applying what they have learned as

well as the production of resources which would support their concrete actions. We have identified autonomous and individual efforts made by professors who have sought in a focused manner to teach CSR in a practical and formal way applying a group of methods which stimulate a more critical and deeper vision of it. However, BS, due to pressure from the market and accrediting agencies, end up including CSR in their syllabuses in a rushed manner which just underlines the ways in which they are not following these practices themselves as a company. Disciplines often do not accompany the knowledge and experience of professors and are limited to mainstream Anglo-Saxon content without offering students more than reflections about this contemporary complex subject which is constantly changing. In addition to analyzing the limitations which prevent the teaching of CSR from being effective, this article seeks to contribute to the field by indicating avenues for future research which could analyze specific regions and countries, producing new local data, and the description of teaching methods which could be applied with necessary adjustments by professors all over the world. In Brazil, for example, we see a lack of deeper studies of this subject, mainly in terms of methodological practices that would be of great help to professors. Finally, we hope that this study encourages BS and professors to produce programs, materials and methodologies which deal with their own local reality so that CSR can be more than just a metric to be followed or a reflection that is empty of meaning.

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## BASIC MANAGEMENT FUNCTIONS - CHALLENGES DURING THE COVID-19 PANDEMIC

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### ABSTRACT

*The challenges that managers face in performing their managerial functions during the covid-19 pandemic are numerous. The aim of this paper is to investigate the problems that managers face in performing their managerial functions. The three biggest problems are noticeable, the psychological aspect (care for employees who are under stress due to the covid-19 pandemic), rising prices of raw materials needed for business and the inability to plan due to instability in business caused by the covid-19 pandemic. During the covid 19 pandemic, managers are more exposed to stress in performing managerial functions and spend more time caring for employee satisfaction and maintaining the health of the collective. Also, the increase in raw material prices makes the company's current operations more difficult. In the part of the research, an interview is conducted with 35 operational managers in Croatian companies, in January 2022, with pre-prepared questions related to the daily performance of managerial functions in companies during the covid-19 pandemic. The data obtained by the interview are statistically presented in the chapter research results. The scientific contribution of this paper is reflected in the research of the problems that managers face in performing their managerial functions during the covid-19 pandemic. Managers point out that they are more stressed, as are employees. It is more difficult for them to perform all managerial functions, and they have the most problems with the planning function, because there is an unplanned absence of workers in the workplace every day, which directly affects another managerial function, organization. The problems caused by the covid-19 pandemic are visible in the performance of all managerial functions, and least of all in the performance of the control function.*

**Keywords:** *managers, managerial functions, covid-19 pandemic, human resources, uncertainty*

### 1. INTRODUCTION

Managers are responsible for a range of functions in the company, such as planning, organizing, leading and motivating, human resource management and control. These functions follow one another, and managers need to devote enough time and attention to each. All management functions are equally important and interdependent. An increasingly important managerial function in companies is the function of human resources management. Managers and business owners are becoming increasingly aware of the importance of this function because employees are the driver of all activities in the company, they are an intangible resource necessary in all organizations and create added value and synergy in companies.

Business communication in companies should be timely and two-way, in order to achieve the set goals. Today we are witnessing constant changes in the environment and companies must adapt to these changes and align their business with changes in the environment. Managers must consider the changes that take place in the environment daily, because these changes affect their business, and the changes are unpredictable, every day and exist in all areas of life and work. During the covid-19 pandemic, these changes are even more expressed, complex, and cannot be influenced by many managers, but they have to adapt to the new changes to the best of their knowledge and ability. During the covid 19 pandemic, managers have additional worries, health of employees and customers (clients) and make great psychological efforts to ensure it all and meet the new prescribed epidemiological measures and requirements, which requires an additional budget. Also, during covid-19, large delays in deliveries of raw materials and goods from suppliers began. There are several additional problems that managers face during the global covid-19 pandemic, and they will be discussed in the chapter on the results of scientific research.

## 2. MANAGERIAL FUNCTIONS IN COMPANIES

Management functions are:

- **Planning:** choosing goals and predetermining the expected quantities and quality of work to be done
- **Organizing:** specifying the ways and means to perform each planned work
- **Leadership and motivation:** stimulating employees to achieve expected results
- **Controlling:** evaluating whether the realized jobs meet the expectations in quantity and quality
- **Human resource management:** the latest management function related to attracting, maintaining and compensating employees (Pfeifer, 2006: 4).

Decision-making is not an easy job and entails great consequences, whether negative or positive, and creates certain effects on the organization itself, its business success, and on employees. Managers at all levels, be they top, middle or junior managers, decide and make decisions that are crucial for the company, and their decisions contribute to the success or failure of the company, or the realization of profit or loss in the company. During the covid-19 pandemic, managerial functions are subject to daily reflection by managers, are more often used and intertwined, and managers need to take care of the health of their employees and customers in addition to their daily work, by implementing all prescribed epidemiological measures. Timely communication is important and indispensable in all companies and in all management functions. Communication in companies should be a two-way process, and not a one-way process, and that is the process in which the so-called feedback, or feedback between managers and employees. It is by no means good for a company that communication is a one-way process and that there is no feedback between managers and employees. Communication between management levels and employees themselves should be two-way, not one-way. That communication should be noise-free in communication, and problems should be resolved promptly. The success of communication depends on all participants, because their previous experiences and giving common same or similar meanings to the message greatly affect the success of the communication event. (Lamza-Maronić and Glavaš, 2008: 10) Managers should pay extra attention to communication during the covid-19 pandemic. There has always been a need for a quick response from managers in performing all managerial functions, and during a global pandemic these demands for quick and accurate response, for fast and accurate information are even more expressed.

### **2.1. Managerial function planning**

During covid-19, it is a great challenge for managers not to deviate from the set and adopted plan or to deviate minimally, because business processes are greatly slowed down by the procurement of raw materials for the production and delivery of finished products. Through planning, managers set organizational goals, and identify the necessary resources and activities that need to be carried out to achieve the goals before they start their realization (Pfeifer, 2006: 29). Planning forces organizations to think ahead, so not to think exclusively about everyday activities and problems, but to prepare for the upcoming business conditions. Namely, it is said that if you do not know where you are going every way is good. For this reason, planning is extremely important for the management of organizations because only for organizations that plan, so they know where they want to go, i.e. what they want to achieve, it can be said that they are looking for, or know the best way to get there (Sikavica et al, 2008: 140). Due to the covid-19 pandemic, the planning function is subject to more frequent revisions, due to changes in the external environment surrounding companies. It is necessary to carry out planning continuously and revise existing plans, because today's companies operate in an extremely uncertain, complex, dynamic and turbulent environment, to which they must constantly adapt and change their plans accordingly. In the case of long-term business plans, the limits are reduced during the covid-19 pandemic, which implies the adoption of long-term business plans for an ever-shorter period, due to changes due to external factors and adaptation to other ways of doing business which include safety health risks in business. Planning coordinates all business activities in the company. The benefits and effects of planning are multiple, planning reduces the risks that threaten the company from the environment. In a situation where managers do not act in their business activities as planned, the company's management is not ready to adapt to the increasingly frequent changes that occur almost every day. Predicting the future situation within the organization is enabled by the managerial planning function, and managers use the planning function to influence all other business functions, but also to develop their competencies and the competencies of their employees. Today's companies operate in a very uncertain, dynamic and turbulent environment, so planning is only imposed on managers as necessary and planning as a function of management should formally exist in all larger companies. During the covid-19 pandemic, medium- and long-term planning pushes the boundaries, ie reduces the time of business plans, so that management can react at any time to changing environmental conditions and harmonize their business plans with prescribed health requirements.

### **2.2. Managerial function organizing**

The world we live in is full of many different organizations, such as kindergartens, schools, colleges and companies, and everyone belongs to an organization. Organizing is one of the functions of management. The most important task of the organizing function is to determine the roles of people working together. People will work best together if they know precisely and clearly what their roles are, what tasks they have to perform, i.e. who needs to do what. How well managers perform the function of organizing depends on the knowledge and ability of the manager to connect all the resources in the organization in the best possible way into one meaningful whole. This is by no means an easy job for managers, as they operate in an increasingly turbulent and complex environment where change is constant and unpredictable. Covid-19 has contributed to even greater uncertainty in companies and even greater demands for the adaptation of all employees and all levels of management to more organizationally demanding working conditions, greater problems in business and ensuring safe health conditions in companies.



### **2.3. Decision making**

One of the most important activities of managers is decision making, ie decision making. It could be said that management is realized by the decisions it makes. In fact, in each of the functions of management, for it to be performed, a decision must be made, whether it is about planning, organization or something else. By the nature of their actions, managers are decision makers, which makes them significantly different and significantly more responsible than several other actors in the business process of the company. Bearing in mind precisely this imperative of responsibility for the outcome of the decision-making process, their importance in organizations is unquestionable (Sikavica, 2008: 29). Therefore, managers must make decisions on a daily basis, very fast, but in a way that satisfies all stakeholders with these decisions, employees and management on one hand, as internal factors that directly affect the company's business, and banks, competitors, government, customers and suppliers on the other hand, what are the external factors, ie factors that affect the company's operations and also to achieve a positive result of the company's operations, and create added value by planning business activities, motivating employees, delegating authority and business control. Managerial work is not easy at all, it is aimed at achieving the company's business goals, in the most efficient way (with the lowest costs) and with the most effective way (in the best possible way). Managers are determined, brave and persistent in defining and achieving company goals, they are primarily visionaries, who know exactly which direction the company should go, who could motivate employees to create added value, maximum employee engagement to achieve good business results.

### **2.4. Managerial function human resource management**

People are the most important resource in the organization, they are the initiators and executors of all activities in the organization and they need to be given great attention. Managers should be aware of the importance of human resources for the success of their companies. The benefits of human resource planning can be seen in the benefits of organizations where systematic and long-term human resource planning is an integral part of business planning. Thus, successful human resources planning gives organizations a competitive advantage (because they become more flexible and enterprising), enables employment and retention of the required number of people of desired quality and optimal use of people and avoiding overstaffing (resulting in more meaningful additional education) and targeted and timely development of managers, leads to greater employee satisfaction, reduces human resources costs and has other benefits such as forecasting labour costs, calculating productivity, etc. (Sikavica et al, 2008: 656).

### **2.5. Leadership and motivation as a managerial function**

Leadership is a function of management that cannot be transferred to others, which depends on the ability of the leader to influence employees and direct them to achieve organizational goals to maximize the company's profits and be as successful as possible in every sense of the word. Motivation as a function of management is a very important business function that affects the success of a company. Energetic, satisfied and motivated employees will contribute much more to the company with their work than dissatisfied and frustrated employees. A leader is a person who guides employees in the organization, who leads their daily business schedule, but also who has a vision of which direction the company should go in the future. It is a person who inspires others to achieve the best possible results, which employees enthusiastically follow and trust. Leadership is a managerial function of particular importance in enterprises during covid-19. Namely, more than ever, employees need support and a leader who knows how to gain the trust of employees. Motivation is a very important function of management, because it encourages employees to achieve the best possible results, and the individual sum of which gives the overall success of an organization.

Employees can be motivated in various ways, and the basic way of motivation is salary, then various bonuses and rewards, additional employee education and more. However, in addition to material factors, there are also intangible factors of employee motivation, such as: good working atmosphere in the company, correct employees and correct managers, cultural and polite approach of managers to employees, a sense of support from employees, giving various powers to employees. they were even more motivated and with their efforts and efforts to directly influence the success of the company.

### **2.6. Control as a managerial function**

Control as a function of management is extremely important and should be timely. The establishment of a control system reduces errors in companies and thus reduces costs in the company. Control is the last but not the least important managerial function in the management process, which, by comparing what has been achieved with the planned, connects or integrates the entire management process. Without the function of control, the work of management would be inefficient (Sikavica et al, 2008: 27). Control should not serve to intimidate employees, but on the contrary, employees themselves should be aware that control actually improves their daily work. Everyone has the right to make mistakes and mistakes at work happen, but it is important that they do not happen every day and in the same areas. Mistakes exist in both private and business life for people or employees to learn from them. Of course, every employee should try to minimize mistakes and try not to repeat the same mistakes. Although most people are wary of too many controls and employees are not at all comfortable, control is an indispensable managerial function that reduces business costs and eliminates possible irregularities and errors, all with the aim of achieving better business results in the company.

## **3. RESEARCH METHODOLOGY**

The survey was conducted in January 2022, using the method of interviews in Croatian companies on a sample of 35 operational managers (N = 35). The questions in the interview were prepared in advance, but the answers of the respondents were extensive. The data obtained from the interview were entered into the SPSS statistical program.

The aim of the research is to get answers to the following questions:

- Question No. 1: Has the covid-19 pandemic caused new difficulties and problems in performing basic managerial functions: planning, organizing, leading and motivating, human resource management and control?
- Question No. 2: Are the deadlines for performing the managerial planning function shortened?
- Question No. 3: Are the covid-19 pandemic managers more stressed in performing managerial functions?

The setting is two hypotheses.

- H1: Managers face new problems and difficulties in performing their managerial functions during the covid-19 pandemic
- H2: The first managerial function - planning for the covid-19 pandemic has shortened planning cycles.

The study involved 35 operational managers, 22 women and 13 men, as shown in Table 1.

		Gender			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	13	37,1	37,1	37,1
	Female	22	62,9	62,9	100,0
	Total	35	100,0	100,0	

*Table 1: Respondents in an interview by gender*  
(Source: Autor's creation using the statistical program SPSS)

According to the completed level of education, most operational managers have graduated from the University (Table 2).

		Completed degree			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High School	3	8,6	8,6	8,6
	College	23	65,7	65,7	74,3
	Master's Degree	8	22,9	22,9	97,1
	PhD	1	2,9	2,9	100,0
	Total	35	100,0	100,0	

*Table 2: Completed degree*  
(Source: Autor's creation using the statistical program SPSS)

In the statistical sample of 35 respondents (N = 35), the youngest respondent is 36 years old, and the respondent with the maximum number of years is 62 years old.

Statistics		
Age	Valid	35
	Missing	0
Mean		48,14
Median		49,00
Std. Deviation		7,507
Range		26
Minimum		36
Maximum		62
Percentiles	25	42,00
	50	49,00
	75	54,00

*Table 3: Age of respondents*  
(Source: Autor's creation using the statistical program SPSS)

#### 4. RESEARCH RESULTS

An interview method has been used to question operational managers and it refers to the difficulties that arise in performing managerial functions during the covid-19 pandemic. The private company employs 8 respondents (22.9%), while the state - owned company employs 27 respondents (77.1%), as shown in Table 4.

		Whether you work in a private or state-owned company?			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Private	8	22,9	22,9	22,9
	State-owned	27	77,1	77,1	100,0
	Total	35	100,0	100,0	

*Table 4: Respondent's employer*  
(Source: Autor's creation using the statistical program SPSS)

Furthermore, respondents were asked in an interview whether the external environment of the company has changed (Table 5).

Operations managers state (80% of them) that the external environment of companies has changed in these segments: delays in the delivery of goods from suppliers and legal regulations that companies must comply with and relate to measures to combat the covid-19 pandemic.

Has the external environment of the company changed?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	7	20,0	20,0	20,0
	Yes	28	80,0	80,0	100,0
	Total	35	100,0	100,0	

*Table 5: Changing the external environment of the company  
(Source: Autor's creation using the statistical program SPSS)*

Whether managers are more exposed to stress in performing their managerial functions during the covid-19 pandemic is shown in Table 6. 85.7% of respondents are now, during the pandemic, more exposed to stress than before the pandemic.

Are you more exposed to stress?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5	14,3	14,3	14,3
	Yes	30	85,7	85,7	100,0
	Total	35	100,0	100,0	

*Table 6: Managers' exposure to stress during the covid-19 pandemic  
(Source: Autor's creation using the statistical program SPSS)*

Are employees more exposed to stress during the covid-19 pandemic? The percentage is identical (85.7%) as the stress exposure of managers. Managers were asked to assess whether their employees were also more exposed to stress during the covid-19 pandemic, and managers knew their employees very well and received feedback from them daily about their feelings.

Are your employees more exposed to stress?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5	14,3	14,3	14,3
	Yes	30	85,7	85,7	100,0
	Total	35	100,0	100,0	

*Table 7: Employee stress exposure during the covid-19 pandemic  
(Source: Autor's creation using the statistical program SPSS)*

Furthermore, operational managers were asked whether they saw changes in the performance of the managerial planning function during the covid-19 pandemic (Table 8). A high percentage (91.4%) of managers state that changes in the managerial planning function are present. They point out that planning is almost non-existent, that planning is done daily (planning weekly activities). Some managers point out that plans change from hour to hour, not from day to day, for example due to employee illness. During the interview, the most noticeable change in the managerial function is planning, because planning during the covid-19 pandemic becomes more unpredictable than before the pandemic, planning cycles are shortened, and some managers point out that planning no longer exists because they can no longer predict outcomes due to unpredictable business situations in whole. Also, operational managers point out that they can no longer plan long-term and medium-term plans, due to business uncertainties and factors beyond their control (prices of raw materials and goods, delays in delivery by suppliers, etc.) and sick leave. The planning of all activities is unpredictable due to the isolation and self-isolation of managers and employees.

Is there a change in the managerial planning function?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	3	8,6	8,6	8,6
	Yes	32	91,4	91,4	100,0
	Total	35	100,0	100,0	

*Table 8: Managerial planning function during covid-19*  
(Source: Autor's creation using the statistical program SPSS)

The managerial function of planning was also reflected in the managerial function of organizing. 91.4% of managers are of the opinion that they feel great changes in the managerial function of organizing (Table 9). It becomes more difficult to organize daily activities, seminars, workshops and other business activities, due to illness (isolation and self-isolation) of employees, managers and business partners. It often happens that pre-scheduled and planned activities are cancelled due to covid-19, i.e. due to unforeseen and long-term sick leave of employees and business partners. Covid-19 has greatly negatively affected the managerial function of organizing.

Is there a change in the managerial function of organizing?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	3	8,6	8,6	8,6
	Yes	32	91,4	91,4	100,0
	Total	35	100,0	100,0	

*Table 9: Managerial function organizing during covid-19*  
(Source: Autor's creation using the statistical program SPSS)

88.6% of managers point out that they also experience changes in the leadership function (Table 9). They point out that employees are more dissatisfied, that they are under stress and that it is harder to lead teams, due to frequent absences from work due to illness (isolation and self-isolation) and that enthusiasm for workers in this difficult psychological situation of the covid-19 pandemic has dropped.

Is there a change in the managerial leadership function?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	4	11,4	11,4	11,4
	Yes	31	88,6	88,6	100,0
	Total	35	100,0	100,0	

*Table 10: Managerial leadership function during covid-19*  
(Source: Autor's creation using the statistical program SPSS)

Respondents (operational managers) point out that the motivation of workers in the workplace has decreased, 62.9%, or 22 out of 35 managers agree with this statement. Managers were asked if covid-19 had a negative impact on human resources, 88.6% of managers answered in the affirmative. The only managerial function not affected by the covid-19 pandemic is the control function. 94.3% of managers state that covid-19 has no influence on the control function.

Does covid-19 affect the managerial control function?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	33	94,3	94,3	94,3
	Yes	2	5,7	5,7	100,0
	Total	35	100,0	100,0	

*Table 11: Managerial control function during covid-19*  
(Source: Autor's creation using the statistical program SPSS)

During the interviews, managers point out that during the covid-19 pandemic there are more misunderstandings and misunderstandings within the team (80% of managers point out), and that the tolerance rate is very low due to the psychological impact of covid-19 on the whole team. 94.3% of managers report increased sick leave compared to the time before the pandemic. Only 2 managers out of 35 respondents pointed out that the pandemic did not affect their business, and these are companies that operated online even before the pandemic, companies for the preparation of EU projects. A high percentage of respondents, 94.3%, or 33 managers out of 35 surveyed managers stated that teamwork was reduced, due to sick leave of workers and compliance with all epidemiological measures. After the interviews, presentation and analysis of the data obtained by the interview, both hypotheses are confirmed, managers are faced with new problems and difficulties during the covid-19 pandemic and the managerial planning function has shorter planning cycles than before the pandemic.

## 5. CONCLUSION

In the case of long-term business plans, the limits are reduced during the covid-19 pandemic, which implies the adoption of long-term business plans for an ever-shorter period of time, due to changes due to external factors and adaptation to other ways of doing business. In addition to long-term, the planning cycle has been reduced for short-term plans, due to business uncertainty caused by the covid-19 pandemic. Covid-19 has contributed to even greater uncertainty in companies and even greater demands for the adaptation of all employees and all levels of management to more organizationally demanding working conditions, greater difficulties in doing business and ensuring safe health conditions in companies. Leadership is a managerial function of particular importance in companies during covid 19. Namely, employees need more support than ever and a leader who knows how to gain the trust of employees. Teamwork in companies has been greatly reduced, due to isolation and self-isolation, and employees, as well as managers, are more exposed to stress than before the pandemic. It is more difficult for managers to carry out the managerial function of planning and organizing during a pandemic.

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## STUDY OF MOROCCAN SOFT POWER IN TIMES OF THE COVID-19 HEALTH CRISIS

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### ABSTRACT

*The coronavirus or covid-19, has been the primary concern of governments around the world since its appearance in 2020. Morocco, like other countries around the world, places the coronavirus among its main priorities, but still the examination and analysis of the impact of the health crisis compared to other countries on the continent and other countries in the world shows the effectiveness and efficiency of the taken measures. Nevertheless, Morocco has also benefited of this crisis to strengthen ties with African countries and consolidate its soft power. In addition to that, King Mohammed VI launched, on April 13, 2020, an initiative of the Heads of States of the African continent to enable the sharing of experience and good practices, to deal with the multidimensional impact of pandemic. Moreover, Morocco has proposed concert solutions to support African countries in the management of the health crisis in its various stages. The Moroccan model in the management of the health crisis has been approved by the WHO and other international organizations, the same model has been used as a means to strengthen the position of Moroccan soft power in Africa, and in the rest of the world. Moroccan companies based in Africa have also contributed to strengthening Morocco's soft power in Africa, in Abidjan, for example, a Moroccan company, "UNIVERS DES EPI", donated a large batch of medical kits to the health ministry. Such initiatives have allowed Morocco to strengthen its geopolitical position in the continent, and transmitting a message to African countries that Morocco is faithful to the historical ties and its commitments even in crises. Morocco has harvested the fruits of its soft power strategy in the era of the covid-19 health crisis, through the strengthening of its territorial integrity with a drilling historical diplomatic crowned by the recognition of several African countries of full sovereignty of the Kingdom of Morocco over the Sahara. Furthermore, Morocco has signed several economic and social cooperation agreements with several African countries. The Moroccan pragmatical approach in managing the health crisis is limited not only to the health dimension, but also a political and geopolitical dimension. The paper analyzes the role of the measures taken by the Moroccan authorities in strengthening Moroccan soft power through the following axes:*

- 1) Covid-19 and Africa: Morocco, a model in crisis health management?*
- 2) Perspectives on the soft power tools of Morocco in the context of the health crisis.*
- 3) Impact of COVID-19 on Moroccan's soft power in Africa.*
- 4) After Covid-19: Perspectives on Moroccan's soft power.*

**Keywords:** *soft power, Africa, Health crisis, COVID-19*

### 1. COVID-19 AND AFRICA: MOROCCO, A MODEL IN CRISIS HEALTH MANAGEMENT?

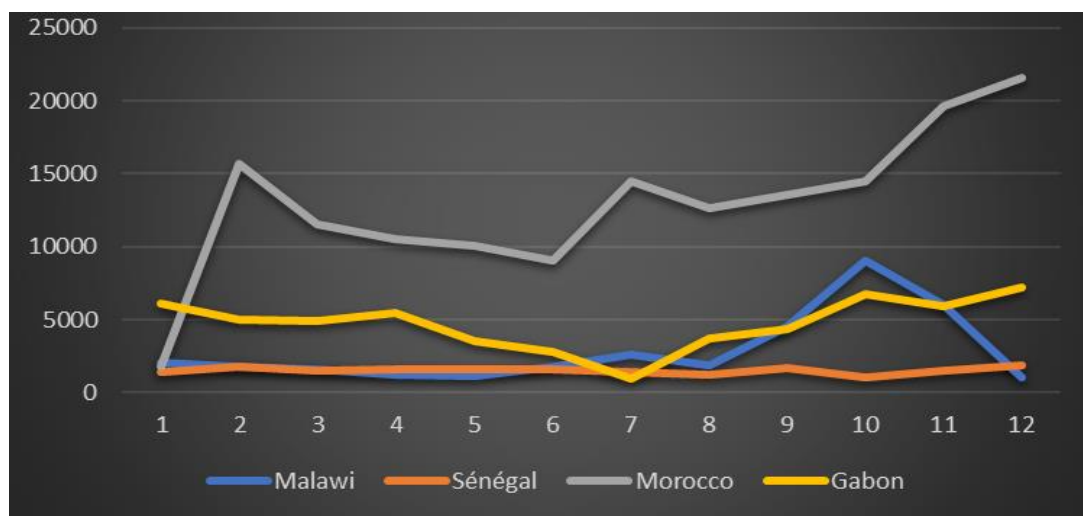
A study of the literature review shows how the health crisis has upset the economic and social life of several countries around the world. The scale, the suddenness and the universality are the main characteristics of the health crisis, hence the need to adopt innovative emergency plans that perfectly meet the requirements dictated by current times.



Morocco was one of the first African countries to experience this outbreak and made courageous and timely decisions to limit the spread of covid-19. To this end, Morocco has demonstrated a strong capacity to manage and adapt to change, following the crisis management model implemented.

### 1.1. Situation of the health crisis in Morocco

The epidemiological situation in 2021 continues to worsen despite various efforts by Morocco to limit the spread of new coronavirus variants. At the date of 31 December 2021, Morocco has a number of cases of 963,092, a number of healings equal to 940,193 and a total of 14,849 deaths, the figures continue to increase in the absence of an effective health solution. Morocco has undergone several waves of contamination following the appearance of a series of variants of the Covid-19 virus, mainly Alpha, Delta and Omicron. The health authorities stressed the importance of vaccination in limiting the spread of the Virus among citizens.



*Figure 1: Covid-19 in Africa 2021*  
*Source: World Health Organization data 2021*

The number of cases of Covid-19 in Morocco and in African countries (Malawi, Senegal and Gabon) continued to increase in 2021, despite all the measures taken by African countries. African countries that experienced stagnation in the number of cases at the beginning of the pandemic could not resist the changes dictated by the pandemic. The health situation of Morocco since the beginning of the epidemic has passed through medium-term cycles, these cycles have been accompanied by a set of measures and protocols. Indeed, it is important to point out the limited capacity of the Moroccan health system compared to other regions in the world, with a limited number of beds, intensive care units and health professionals. Morocco has also strengthened its screening capacity since the beginning of the health crisis to limit the spread of the virus, through a selective strategy, which is based mainly on a risk approach. Regarding the situation of the health facilities, they also represent a satisfactory number with a limited capacity of reception.

### 1.2. The management of the health crisis by Morocco

The management of the health crisis was characterized by efficiency and spontaneity. Indeed, the outbreak of the first case of Covid-19 in Morocco was accompanied by decision by the King Mohammed SIX to create a special purpose fund dedicated mainly raised to finance the management of the health crisis. It should be noted that the measures were introduced in a gradual manner according to a precautionary approach.

The measures and actions taken by Morocco have been applauded by several countries, the main ones are:

- Morocco has privileged the protection of its citizens to the economy, this action remains a great signal to the rest of the world, in order to demonstrate that the Moroccan people remains the first priority for the Moroccan Government.
- Establishment of a CORONAVIRUS Command Post at the territorial level to monitor and coordinate,
- Strict control of travel within the country, and to and from Morocco.
- The closure of public places, and the shutdown of private and public services in an ideal time.
- Take a study or remote working approach to limit the spread of the Virus.
- Building hospitals in a short period of time to address existing Covid cases.
- The mobilization of Moroccan textile companies for the production of masks and respirators.
- The integration of the private sector into the health crisis management process.
- Integrate rich people into support programs for people who have lost their jobs.
- Subsidy for families in confinement through financial and other assistance.
- Subsidizing businesses affected by the Covid-19 crisis, as well as deferring tax returns, deferring credit payments.

Thus, Morocco has put in place several measures to revive the economy, through the financing of small businesses and auto entrepreneurs. For its part, the Moroccan people have been aware of the degree of health risk, and there is a clear commitment on their part in the strict application of the measures. As well as the establishment of a health emergency law was the cornerstone of all the actions and measures taken. In addition to the vertical solidarity carried by the «Protective State», a horizontal solidarity has been established by economic and social actors. Citizen companies, hotel units and other actors have presented different types of help to the population. The measures taken by Moroccan companies are the product of a pure and identical Moroccan vision.

## **2. THE MOROCCAN MODEL OF THE HEALTH CRISIS**

The management of the health crisis by the authorities has been based on an innovative, general and pragmatic approach. It was clear that the government's decisions were classified into two major phases, namely the confinement phase and the post-confinement phase. In the first phase, the Government concentrated on strengthening its position as a protective State by taking health and social decisions. In the same time, the authorities adopted a strategy of health risk avoidance in order to understand the new epidemiological situation, through strict restrictive measures. The Moroccan Government has established a number of scenarios depending on the epidemiological situation of each region. Morocco took advantage of decentralization of the administration to implement the majority of decisions at the territorial level. In this sense, the decision-making process and enforcement has narrowed, and decisions have become more credible as they arise from the momentary context of the population. In the second phase, Morocco focused on economic recovery and the establishment of health security. Indeed, Morocco has taken a set of measures to establish a new model of economic balance and sustainable development. These economic measures were developed using an opportunistic approach. As a result, the health crisis has contributed to the consecration of the State as the only entity capable of managing the crises. This is the main idea behind a report by the Policy Center for the New South. This report indicates that despite the fact that the pandemic has contributed to the rehabilitation of the role of the State as a public authority – a protector, and a provider of assistance to the most vulnerable.

Some populations have been put at risk by the health emergency measures decreed by the authorities.<sup>1</sup> Thus, it is important to note that the health crisis is an opportunity to reformulate the model of targeting poor and vulnerable people. These targeting difficulties have become the main reason for social insecurity. The experience of granting financial donations through Operation “TADAMOUN” has shown how important the targeting of the population is in crisis management. The Communication remains an important component in the management of the health crisis, a good communication of the situation of the crisis ensures transparency and gives great legitimacy to the measures taken by public authorities. Thus, the quality of the communication media remains a determining factor in the success of the communication strategies of the health crisis. Also, Morocco chose the production with its own means the materials necessary for the management of the health crisis, namely Kits, masks and other medical materials. The choice of medical independence was necessary in a context of high demand and competition. The Moroccan model of managing the health crisis has been applauded and encouraged by the World Health Organization, as it has shown its effectiveness during the covid period. As well as Morocco has set a good example for African countries in managing the crisis.

### **2.1. Perspectives on the soft power tools of Morocco in the context of the health crisis**

Morocco seized the opportunity created by the Covid-19 pandemic to strengthen its regional power at the level of Africa and the Mediterranean. Since Morocco's reintegration into the African community in 2017, it has continued to adopt a collaborative approach with all African countries. These collaborative efforts are mainly in the areas of food security, cooperation in the field of migration, counter-terrorism and other areas of cooperation. Morocco also benefited from its accumulated expertise in managing the health crisis in order to initiate reforms in the continent. In light of this crisis several African countries have called for meetings via social networks with Moroccan officials to understand the Moroccan model in the management of the health crisis. In this sense, King Mohammed VI launched, on April 13, 2020, an initiative of the African Heads of State to allow a sharing of experience and good practices, to face the multidimensional impact of the pandemic. Similarly, Morocco has proposed concrete and pragmatic solutions to support African countries in managing the health crisis in its various stages. On the other hand, Morocco has strengthened its ties of solidarity with friends African countries by sending medical aid in April 2020 from Moroccan factories in accordance with the standards required by the World Health Organization, and this in favor of 15 African leaders in the first place in addition to other countries that benefited from this action, this aid concretizes Morocco's desire to build strong ties with African countries, and strengthens its image of loyalty to its African partners. On the other hand, the African subsidiaries of Moroccan groups established in Africa, such as Atlantic Business International (ABI), a sub-Saharan subsidiary of the Banque Centrale Populaire Group (BCP), which allocated FCFA 200 million, or nearly 305,000 Euros, the Côte d'Ivoire Solidarity Fund Covid-19. This contribution is part of a global envelope of 750 million FCFA (approximately 1.2 million Euros), dedicated to the fight against Coronavirus in the countries of presence of the BCP Group in UEMOA (West African Economic and Monetary Union) and Guinea, according to Atlantic Business International<sup>2</sup>. In the same context, Morocco's judicious choice of the moment of the health crisis to implement its commitments to Africa has strengthened the confidence of African countries in Morocco's commitments to Africa. Also, the support presented by Morocco to African countries in a context marked by uncertainty especially as Morocco is not as safe from the risks of the health crisis.

<sup>1</sup> [https://dcaf.ch/sites/default/files/publications/documents/DCAF-CEDHD\\_Post-Conf\\_RapportFR.pdf](https://dcaf.ch/sites/default/files/publications/documents/DCAF-CEDHD_Post-Conf_RapportFR.pdf)

<sup>2</sup> Coronavirus : Des acteurs marocains tendent la main à l'Afrique, Le 06-05-2020: <https://www.challenge.ma/coronavirus-des-acteursmarocains-tendent-la-main-a-lafrique-138548/>

In this sense, Mr. H'Midouche confirmed that Morocco's commitment to defend the causes and interests of Africa does not date today, he said, noting that it is rather "an immutable orientation inherited from his history and which he continues to realize with confidence and pride, making of him a true "Honest Broker" and a credible interlocutor, a sure friend on whom we can count in all circumstances in happiness and unhappiness". This initiative adds to the list of numerous concrete royal initiatives in favor of the African continent on several issues of strategic and political interest»<sup>3</sup>. As well as the offer of the Moroccan experience at the disposal of the African countries has made it possible to integrate the Moroccan model in the management of the health crisis at the bottom of the strategies of the African countries. As well as the various actions undertaken by Moroccan companies in favor of the host countries have confirmed the position of Moroccan companies in Africa and have shown their societal commitments. Finally, it is important to point out that the means used by Morocco during the health crisis to strengthen its soft power are of great importance, these tools have been accompanied by diplomatic and economic efforts, by signing several conventions and agreements. In this way, Morocco recently inaugurated the first factory in Africa for the manufacture of vaccines, which will be destined for the Moroccan, African markets and the rest of the world.

### **3. IMPACT OF COVID-19 ON MOROCCAN'S SOFT POWER IN AFRICA**

Morocco's soft power effort during the period of the health crisis was crowned by a strengthening of Morocco's soft power status in Africa. Indeed, the health crisis has positively impacted the Moroccan soft power in Africa. As a result, during this period of health crisis, Morocco was able to sign a significant number of agreements and conventions with African countries in the various fields, mainly security, economic, military and health cooperation. Also, Morocco successfully integrated 41 international organizations in 2021 against 29 in 2020, reflecting the confidence that the international community places in Morocco's expertise and skills in the face of global challenges. These compelling successes reinforce the Kingdom's strategy to strengthen its presence and visibility within the multilateral system, in accordance with the High Royal Guidelines, set out in the Royal Message to the First Conference of Ambassadors of His Majesty the King, "to strengthen the performance of national diplomacy and thereby to strengthen the Kingdom's position as an active member and leader of the international community." Similarly, Morocco was re-elected in several international organizations, at the same time, Morocco was appointed as Africa's representative on the Consultative Council of the United Nations Food Summit, as well as Co-Chair of the ECOSOC Group of Friends of National Voluntary Examinations (VNR). In addition, Morocco experienced a diplomatic victory on the Sahara issue during the period of the health crisis, through a significant number of countries that have definitively recognized the territorial integrity of Morocco mainly that of the United States, in return, more than 20 countries opened consulates in the cities of Laâyoune and Dakhla during 2020 and 2021. These results are the result of an effort by Morocco in the establishment of its regional power, as well as its ability to influence international opinion.

### **4. AFTER COVID-19: PERSPECTIVES ON MOROCCAN'S SOFT POWER**

The coronavirus pandemic has redefined the geopolitical rules of the game. From now on, States must face new realities, and will have to put in place new strategies capable of meeting new challenges. Indeed, the health crisis will reshape the maps internationally. When the managing countries are busy managing the health situation, the strategists are already preparing for the post-crisis. It is clear that after the coronavirus crisis the world will change, more than the butterfly effect, now we will talk about the coronavirus effect.

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<sup>3</sup> Entretien de La MAP avec Mr Mohammed Hmidouch le vice-Président exécutif del'Académie diplomatique africaine (ADA).

With a strong return of the State. Passing from the strategist State and the resilient State. Less strategic vacuum and dependency, and more protection of the population and resources essential to the continuity of a nation. Also, the formula of Moroccan soft power will undergo immunization against crises, at the same time it should move from geopolitics of fear to another of hope based on encouraging initiatives and building a path of hope in the face of a reality marked by uncertainty.<sup>4</sup> Thus, the Morocco Mark must be officially inscribed in the economic, political and military language. Finally, it is clear that Morocco has taken advantage of the health crisis to strengthen its brand image, but there is still a way to follow to frame its policy of influence especially in a context of vulnerability and crisis.

## 5. CONCLUSION

The COVID-19 pandemic has not spared the African continent. The Moroccan experience has shown its success in the absence of a universal model to follow. Morocco also took advantage of the health crisis to strengthen its position in Africa and prepare for the post-crisis crisis. The same applies to the geopolitical situation in Africa, which has undergone several changes lately. Thus, it is necessary for Morocco to come out of the health crisis with the least damage in order to continue its policy of influence in Africa.

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# THE WORLD'S FIRST CARBON NEUTRAL FOOTBALL CLUB: THE CASE STUDY OF FOREST GREEN ROVERS

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## ABSTRACT

*Shirts made from bamboo waste and recycled plastic, a stadium powered by 100% renewable energy, organic turf, electric car charging stations and vegan-only food for fans and players. Forest Green Rovers, a team in the English fourth division, have gone from a near-bankrupt British semi-amateur team to the world's first carbon-neutral football club in ten years. Their example is a model of environmental sustainability for major football clubs and representatives of other sports.*

**Keywords:** *sports marketing, green marketing, football marketing, rebranding, responsible branding, carbon neutrality, sustainability, environmental protection, change of mindset, innovation*

## 1. INTRODUCTION

Few people think about environmental pollution in connection with football, although their relationship is obvious. Clubs playing in the higher divisions tend to have large stadiums with thousands or tens of thousands of seats. The buildings need heating and lighting, which can consume a lot of energy. So does the maintenance of a football pitch: not only does it need a lot of water for irrigation to make the grass grow faster, but special lighting at night is also essential, as is heating to keep the well-kept lawn from freezing. Large projectors, scoreboards and advertising boards can also consume a lot of energy (UNFCCC, 2019). Fans eat and drink during matches, which creates a lot of plastic waste. They also use a lot of water in the toilets. On top of this, there is the travel of players and professional staff, not to mention the transport of fans – a burden on the city in the case of home fans, with even more obvious environmental impacts such as carbon emissions in the case of away fans. As a result, a match day can cause a huge load (Mizsur, 2019). But how can this environmental burden be reduced? According to a report published in January 2021 by the Sports Positive Summit, there are eight areas where clubs can make a direct impact and operate in a more environmentally friendly way. These are:

- the use of renewable energy sources
- energy efficiency
- water efficiency
- environmentally friendly transport modes
- waste management
- replacement of single-use plastics
- availability of food which is plant-based or low-carbon
- communication, commitment to green goals

Although Sports Positive Summit analysed the English Premier League teams based on the above, the Fédération Internationale de Football Association (FIFA) says that the greenest club is in the English fourth division. Forest Green Rovers has also received an honourable mention from the United Nations, becoming the first football club in the world to be awarded the title of carbon neutral. In fact, representatives from Premier League clubs now visit Forest Green Rovers from time to time to learn about its good practices. But football clubs from other countries and even other sports are also regular visitors (Lewanczik, 2019).

## **2. GREEN INSTEAD OF BANKRUPTCY**

The birthplace of football is undoubtedly England. It was here that the sport first emerged in its modern form, and it is still hugely popular today. The top division called Premier League is the highest-grossing league in the world – if pandemic restrictions do not make it impossible, teams are playing to sell-out crowds of tens of thousands every week. But even in the fourth or fifth divisions, it is not uncommon to see games with several thousand spectators. At the same time, economic stability is not necessarily guaranteed. In England, more and more clubs are facing bankruptcy proceedings, and even clubs with a long tradition and over a hundred years of existence are on the verge of closure (Farkas 2020). This was also the case for Forest Green Rovers, founded in the West of England in 1889. It is true, however, that patina has not necessarily meant success for the English team: Forest Green Rovers have always played in the lower divisions. Even though the county of Gloucestershire has an 'El Glosico', in the manner of the 'El Clásico' game of Real Madrid and Barcelona, the club's clashes against Cheltenham Town are of little interest to people outside the locals. Forest Green Rovers was struggling to survive for years, living day to day on an annual budget that was patched together from donations from the league, the local council and local entrepreneurs. During one such 'fundraising initiative' in 2010, they met Dale Vince, founder and owner of the Ecotricity renewable energy company, one of the region's most successful enterprises. The club asked for a smaller amount of money to support the team, in exchange for any of their display spaces at matches. While he could have asked for anything, Dave Vince saw no business value even in this offer. However, Forest Green Rovers was important to him as a proud localist, thus he offered an 'all-or-nothing' deal: he would buy the whole club, but then it would be remodelled in every way he wanted (Farkas 2020, Rios 2019). His vision was to combine environmental awareness with business goals: he set out to create the world's first carbon-neutral football club, which would obviously also help promote his renewable energy company, the wittily named Ecotricity. However, fans do not like change, so they did not take kindly to him changing the team shirt to neon green (also known as lime green) as one of his first moves. There was also a minor scandal when he changed the blue-red-white colours of the British flag in the crest to black-green-white. Many felt that this was a move to impose the colours of his company Ecotricity on the club, but he argued that the word 'green' is part of the team name and that the club is going green, meaning that the change is based on real transformation and not just a redesign of the club image (Jackson 2019).

## **3. GREEN, NOT IN NAME ONLY**

Earlier in this article, we discussed what a club can do for its environment, to reduce its carbon footprint. Forest Green Rovers' stadium has an organic turf that not only drains rainwater, but also collects and recycles it, providing the water needed for irrigation. The stadium, called New Lawn, is powered entirely by renewable energy, with much of the electricity generated by solar panels placed on the roof of the stadium. The mower is not only electric, but it does not even need a human to operate it – it used GPS coordinates to automatically navigate the field and mow the grass.



The grass is not treated with any herbicides or sprays and is recycled after cutting: a local farmer composts it into topsoil. The involvement of supporters as volunteers is also taken seriously. There have been examples of supporters volunteering to paint the buildings from top to bottom with environmentally friendly paint, saving money for the club's budget and not harming the environment (Gyüszi, 2013; Forbes, 2018). The players' shirts are made from 50% bamboo waste and 50% recycled plastic. A small but important detail is that the shirts are washed with phosphorus-free washing powder at the lowest possible temperature. The team travels in 100% electric vehicles, reducing carbon emissions. They are also trying to encourage fans to do the same, with charging stations at the stadium for those arriving in an electric car, and car-sharing is being promoted. Forest Green Rovers will offset the carbon emissions of fans coming to the New Lawn Stadium and away matches by including a compensation amount in each ticket. "It's a way to tackle emissions linked to transport before we can tackle it in a better way," they told The Sustainability Report. "We can't get an electric bus for away travel and we can't really control how fans come here. But we want to communicate the importance of the issue. So in the interim, we've said 'let's build a carbon offset into every ticket' so that every fan that gets here will have done so in a carbon neutral way." The club will calculate the estimated CO2 emissions by analysing the distance travelled by supporters and the means of transport they use (Ketley, 2019). Although the current stadium is also very environmentally friendly, plans for a new stadium have already been drawn up, which will be equipped with the latest sustainable technologies. Furthermore, the name of the club now includes the word "forest" as well as "green": it will be the first sports facility to be made entirely of wood. The car park will be located in a real "park": 500 trees will be planted and a 1,500-metre hedge will be laid out alongside the stadium to welcome visitors. This is what the name Eco Park refers to. The Eco Park was designed by the star architect Zaha Hadid, who has designed buildings such as the Hong Kong Innovation Tower, the Guangzhou Opera House and the London Aquatics Centre, which was completed for the 2012 London Olympics. Despite this, the Eco Park's green, environmentally friendly concept was initially rejected by the local authority in mid-2019, but it met such an outcry that the ordinance was later changed so that construction could start at the end of the same year (Lewanczik 2019; Rios, 2019). These efforts have already been recognised by the United Nations, with Forest Green Rovers becoming the world's first carbon neutral football club in 2018. As owner Dale Vince put it, "We're a small club with big ambitions, and it's fantastic we can work together to champion the sustainability message worldwide". Miguel Naranjo, Programme Manager of the United Nations Framework Convention on Climate Change (UNFCCC), said: "The beauty about Forest Green Rovers is that it's a small organisation, with not a massive budget and still it's doing so much to address the environmental footprint. So if FGR can do it, anyone can do it as well" (Mitchell, 2018).

#### **4. VEGAN ONLY**

A significant element of the green club model is the use and promotion of environmentally friendly vegan nutrition. According to the club's communication, one of the main reasons for becoming vegan was that mass animal farming has a distinctly negative impact on animal welfare and the environment. Their pioneering and innovative efforts have been recognised by major international institutions, and in 2017 they were the first to be awarded the Vegan Society's Vegan Trademark. Red meat has not been consumed at the club since 2011, and since 2015 only vegan food has been on the menu. This not only means that only vegan food is available in Forest Green Rovers' buffets on match days, but also that the club's staff and even players are served vegan food on a daily basis. No one, but no one, is allowed to bring in or eat meat on club premises (Forbes 2018).

Of course, many people disliked this idea at the beginning. But as Vince Dale puts it, Becoming the world first vegan football club “was the most difficult thing we did, and I would say it wasn’t that hard,” he said, “Football game is once a fortnight for two hours. So why not come and try something different instead of something that you eat every other day of the week? And, you know, our fans did, they came and they tried it and they loved it.” While the number of spectators has quadrupled, the number of food sales has increased fivefold (Rios, 2019). What is more, the players may have benefited from the vegan diet and the resulting easier digestion, as former fifth division Forest Green Rovers were promoted to the fourth division for the first time in their history in 2017. And the fans were very happy about that. After all, let us face it, a good place in the table is more important for a football fan than sustainability. For them, climate change and reducing our ecological footprint are lower in the order of importance than the result against our neighbouring city at the weekend. However, the protection of the environment is a subject that is hard to argue with. There can be little criticism that the club is a founding member of the UN's Sports for Climate Action initiative, or that it was the first football club to sign the EU Eco-Management and Audit Scheme with the European Commission (Lewanczik, 2019; UNFCCC, 2019; Herman 2021). In addition, fans can feel the positive effects of the measures first-hand. Car-sharing, for example, not only allows them to get to matches quicker, but it is also cheaper and increases their circle of friends and acquaintances. Vegan food gives them a different, healthier diet than the classic British cuisine and fast food. After learning about the benefits of renewable energy and seeing solar panels in the stadium, several fans have installed solar panels in their homes. The purchase of electric cars has also increased among them. And all of them have become more educated, more conscious consumers, which is reflected in other purchasing decisions, consumer behaviour and in their efforts to live more sustainably (UNFCCC, 2019).

## 5. PATTERNS FOR YOUNG AND OLD

The team's Ambassador Scheme also promotes sustainability at a local level – the education programme acts as a channel between the Forest Green Rovers club and local educational institutions, effectively bringing the green attitude to the youngest generations. The student ambassadors gain an insight into how the club “has gone green” and how the players themselves represent and promote its values. The programme also distributes 400 shirts to third-graders each year – an ingenious and useful initiative because it is at this age that children decide which team they will cheer for. This gives Forest Green Rovers and its green ambitions even more exposure (UNFCCC 2019). The team also launched a free education programme, Fit2Last, for the local community and educational institutions. The programme explores the linkages and mutual benefits of sustainability, healthy lifestyle education and sport through individual lessons, school trips and visits by players to schools (Lewanczik, 2019). This way, young people are introduced to green thinking in more ways and on more fronts. This is important because young people at this age are open to new, progressive ideas and are therefore more receptive to environmental protection than the generation of their parents. These activities have had an impact on the UK and international scene. As the lead of a recent article put it, “Unless you’ve spent the last five years living in a cave you’ve probably heard of Forest Green Rovers.” (Jackson 2019) Because even though they only play in the fourth division (and not so long ago in the fifth division), the news of their green philosophy and activities have spread everywhere – so much so that, according to their media analysis, they have reached three billion people with their press coverage since 2017 (UNFCCC, 2019). Moreover, Forest Green Rovers, a fourth division club, has its own fan clubs in twenty different countries. When the new shirt was released, orders were received from 16 countries in the first 24 hours, including South Korea, Malaysia, Hong Kong and Australia.

This enthusiasm is hardly justified by success in sport, but more so by the cause they have taken up and represented for more than ten years. Club owner Dale Vince even says, “What I think we’ve created is a new kind of football fan. People that get the environment and they may be interested in football too, to a degree. Some are, and some are less so” (Ketley, 2019).

It is also a great achievement that first division football clubs and top clubs from other sports regularly visit Forest Green Rovers to learn good practices such as vegan burgers, electric car charging stations in car parks and solar panel installation – the latter of which Arsenal implemented after their visit. UEFA, the Bundesliga, World Rugby, Roland Garros, EFL, Sky Sport and even delegations from Wembley Stadium have visited Forest Green Rovers (Lewanczik, 2019).

Dale Vince and the team have been supported by a number of sponsors in recent years, as they can offer a relevant value proposition to any organisation/company that wants to highlight its climate-friendly, green credentials. The first and most important sponsor partnership was of course with the owner company, Ecotricity, a green energy supplier and operator of modern wind farms – the green values they represent are the basis of Forest Green Rovers' paradigm shift. This relationship has now become much more fruitful for the sponsor, with the extra media attention and the resulting network of connections also adding a lot of marketing value to Ecotricity. One of the first sponsors to join the Forest Green Rovers cause was Grondon, which recycles 100 per cent of the waste produced by the club. And to help them achieve the vision of the world's first vegan football club, they have been supported by Quorn, a company that sells vegetarian and vegan food. These partnerships have been ongoing since the change of ownership, meaning that working with Forest Green Rovers has since become a proven and fruitful business for each company. And as for the skull symbol so often used in football caps, Forest Green Rovers' shirts also feature a version of it, thanks to a partnership with international wildlife conservation non-profit Sea Shepherd (Lewanczik, 2019).

In 2020, these collaborations were taken to the next level. The club's new investor was Arsenal professional footballer Hector Bellerín, who became the second largest shareholder in Forest Green Rovers after depositing a substantial sum. Bellerín has been committed to green values for many years and is a vegan himself, and has also pledged to fund the planting of 3,000 trees through a charity for every team win this season. The 25-year-old player has since involved his social media page in the support of Forest Green Rovers and their cause, spreading the message of sustainability and climate neutrality to millions. Bellerín has also helped to put the club on an even firmer financial footing (Farkas 2020).

And what comes next? The club now seeks to extend its values to the world. As one iron law of marketing says, being first in something is one of the keys to business success. Since Forest Green Rovers became the first carbon-neutral football club in the world, everyone has attached this adjective to them, so other clubs can no longer claim the leadership. But there will be followers, and if they can make sustainability more mainstream, it will be good for the planet. As Dale Vince puts it, “It’s great to be first, but I believe it’s only a matter of time before the big boys like Real Madrid, Man United and the San Francisco 49ers follow our example.” But other clubs can also start working on sustainability. For them, too, Vince’s important advice is not to worry about what is out of our control, but to focus on what a club can do to protect the environment (Mitchell, 2018).

## 6. CONCLUSION

*Table 1: The green renewal of the Forest Green Rovers football club*

Category	FGR solution
Use of renewable energy sources	Stadium powered by 100% renewable energy
Energy efficiency	Use of solar panels Automated lawn mowing, using electric equipment
Water use efficiency	Organic lawn carpet
Environmentally friendly transport modes	Electric charging station The team uses 100% electric vehicles Promotion of cycling Promotion of car sharing and public transport for home and away supporters' tours
Waste management	Shirts made from bamboo waste and recycled plastic Composting and recycling of used lawn mats
Replacement of single-use plastics	100% recycled waste (creating a circular ecosystem)
Availability of plant-based or low-carbon foods	Providing only vegan food for fans and players
Communication, commitment to green goals	Complete "greening" of the official club colours Promotion of actions to reduce the ecological footprint of supporters and reward well-performing supporters Involving sponsors and business partners with green values and organising joint actions and promotions with them

*Source: Table created by the authors, based on the article*

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## DISCUSSIONS OF THE LEGAL CONTEXT FOR THE IMPLEMENTATION OF MARINE SPATIAL PLANNING IN BRAZIL

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### ABSTRACT

*Environmental preservation has been discussed for a long time, especially Coastal Zones and their marine spaces in recent years, given the infinity number of activities that take place there. However, due to the number of actors present and conflicts of interest in this environment, there is a need to implement public policies for the Integrated Coastal Zone Management (ICZM), in order to establish rules for the use and occupation of the Coastal Zone and to establish management criteria for the seafront, the need being relevant to deepen academic discussions in the Brazilian scenario. In this sense, this study deals with the history of the legal context for the implementation of the Marine Spatial Planning (MSP) in Brazil, thus contributing to the balance in the ICZM and in particular with regards to the environmental, economic, and social objectives of existing activities in marine areas. Exploratory research was used, noting its close relationship between the achievement of some of the Sustainable Development Goals (SDGs) with the respective elaboration of the MSP. The study is also in line with recent discussions for the adoption of the MSP in the constitution of guidelines for the formulation and execution of plans and actions related to the National Policy for the Conservation and Sustainable Use of the Brazilian Marine Biome, provided for in Bill PL n°. 6.969/2013, in addition to presenting the example of the Portuguese maritime spatial planning and management model. The results indicate that, within the normative context of the elaboration of the MSP, there is no tool that determines preference criteria in situations of conflict of uses or activities in the same region.*

**Keywords:** *Coastal Management, Integrated Coastal Zone Management, Marine Spatial Planning, Marine Territorial Planning*

### 1. INTRODUCTION

Article 225, 4<sup>th</sup> paragraph of the 1988 Constitution of the Federative Republic of Brazil declares the Coastal Zone (CZ) as national heritage, determining that its use shall take place, according to the law, within conditions that ensure environmental preservation, including regarding the use of natural resources, making it a strategically important area. According to Carvalho (2018, p.23), in 2010, the seventeen Brazilian coastal states presented Gross Domestic Product (GDP) and approximate population of R\$ 2 trillion and 149 million people, respectively.

The total share of these states in the national GDP is of 78.36%, on population terms, they represent 78.32% of the national population. Thus, the intense degradation of natural resources puts socioeconomic sustainability and environmental quality of local populations at risk (Prearo Junior et al, 2021, p. 512). During the most part of the last decades, the concern of scientists and conservationists all over the world was focused primarily on the protection of land ecosystems as, among other reasons, the impacts on such environments were more easily observed. However, silently, and less perceptibly, CZ, seas, and oceans all over the world also gradually suffered the effects of the expansion of occupation and human uses, without receiving the due consideration (MMA/SBF/GBA, 2010, p. 6). Besides, the socioeconomic pressures on the CZ are countless, being worth mentioning the accelerated and unguided process of urbanization, resulting in an intense degradation of natural resources, jeopardizing economic sustainability and the environmental quality of populations (Souza, 2009, p.19). In this sense, the occurrence of conflicts between socioeconomic uses in the coastal zone is common, which creates an environment of dispute for the occupation and utilization of natural resources. As an example, it is possible citing the recurring conflicts between fishing, tourism, and ports and/or other maritime activities of exploration and production of oil and natural gas (Frohlich, 2016, p.2). To avoid conflicts, aside from the ones already observed, which are costly for the national economy and mostly to the marine ecosystem, it is ever more important to think of ways of managing the marine environment in a more integrated and sustainable manner. The issue of managing the marine space has been discussed over the years with different approaches, sometimes as an extension of the land part, other times as a priority area for national security or even as a priority area for the conservation of biodiversity (Schiavetti, 2020, p. 52). In virtue of this complexity of existing actors and conflicts, and especially due to its economic, environmental, and social relevance, pertinent public policies were proposed for the Integrated Coastal Zone Management (ICZM). Law n°. 7.661/1988 instituted the National Plan for Coastal Management (NPCM), which specifically aims to guide the rational use of CZ's resources in a way to contribute to the increase in quality of life of its population, and the protection of its natural, historical, ethnic, and cultural heritage. The Resolution n°. 5/1997 from the Interministerial Commission for Sea Resources (ICSR), which approves the National Plan for Coastal Management II (NPCM II) mentions that, besides the instruments for environmental management provided for in article 9 of Law n°. 6.938/1981, that deals with the National Environmental Policy (NEP), the following management instruments for the NPCM are considered: State Plan for Coastal Management (SPCM); City Plan for Coastal Management (CPCM); Information System for Coastal Management (ISCM); Coastal Zone Environmental Monitoring System (CZ-EMS); Coastal Zone Environmental Quality Report (CZ-EQR); Coastal Ecological-Economic Zoning (CEEZ), and the Coastal Zone Management Plan (CZMP). Subsequently, the NPCM was regulated by Decree n°. 5.300/2004, setting general norms aiming the environmental management of the country's coastal zone and establishing the bases for the drawing up of policies, plans, and federal, state, and city level programs. The aforementioned decree also cites that the following instruments are applicable for the CZ management, in an articulated and integrated way, aside from the ones mentioned above, the Coastal Zone Federal Action Plan (FAP); the Coastal Zone Macrodiagnosis and the Project of Integrated Management of the Seafront - *Projeto Orla*. More recently, the National Program of Coastal Line Conservation - PROCOAST was regulated by Ordinance MMA n°. 76/2018 (Scherer and Nicolodi, 2021, p. 257). In Brazil, the Coastal Management Program (COMAN) has been implemented since 1988, having specific legislation and a set of defined strategies and instruments. More recently, the Marine Spatial Planning (MSP) began being discussed in the country. The MSP, in many cases, tends to be more focused in marine areas, not taking into consideration this land and sea interaction (Scherer and Nicolodi, 2021, p. 254). By definition, the MSP is a practical way of creating and establishing a more rational organization for the use

of the marine space and the interaction among its uses, to balance the development demands with the need to protect marine ecosystems, as well as reaching social and economic goals in a transparent and planned form (UNESCO, 2011, p. 3). The MSP is a public process of analysis and allocation of the spatial and time distribution of human activities in marine areas, seeking to reach ecological, economic, and social objectives, generally specified through the political process (UNESCO, 2011, p. 3). According to Ehler and Douvère (2009, p. 18), marine space planning does not lead to a closed plan. It is a continuous and interactive process that learns and adapts over time. The development and implementation of the marine space planning involves a series of stages, including: identifying the need and establishing authority; obtaining financial support; organizing the process through pre-planning; organizing the participation of the interested parties; defining and analysing the existing conditions; defining and analysing future conditions; preparing and approving the spatial management plan; implementing and fulfilling the spatial management plan; monitoring and assessing the performance and adapting the management process of marine space. Thus, this study intends to analyse the history of the regulatory framework for the implementation of the MSP in Brazil, correlating it to the Sustainable Development Goals (SDGs), bringing forth the MSP in the current discussion of Bill n°. 6.969/2013, regarding the National Policy for Conservation and Sustainable Use of the Brazilian Marine Biome (NPCMar) and Portugal's experience with its ordering and management model of the maritime space. Exploratory research was the methodology used in the elaboration of the work, including the gathering of bibliographic, documentary, and legal data to develop the constituting elements of all its foundation. We performed a review of papers published in the portal of journals from the Coordination for the Improvement of Higher Education Personnel (CAPES) and Google Scholar, besides laws, bills, federal decrees, and other legal requirements and classical texts that approach the Brazilian legal context for the implementation of the MSP and Portugal's example in the management of the maritime space ordering and management.

## **2. LEGAL HISTORY FOR THE IMPLEMENTATION OF MSP IN BRAZIL**

According to UNESCO (2011, p. 7), most countries have the maritime space zonings developed for several human activities, such as maritime transportation, oil and gas exploration, development of renewable energy, offshore aquiculture, and waste disposal. However, the problem usually lies in the fact that these activities are planned in isolation and treated case by case, without the effects both on other human activities as well as on the marine environment being considered. Consequently, this form of operation leads to two main types of conflict: conflicts among human uses (user-user conflicts), and conflicts between human uses and marine environment (user-environment conflicts). So, in contrast, the MSP is a process aimed towards the future and may offer ways of solving these types of conflicts, as well as selecting proper management strategies to maintain and safeguard the required ecosystem services (UNESCO, 2011, p. 7). A comprehensive MSP should provide an appropriate environment for the integrated management and serve as reference for the planning of a determined sector without, however, replacing the need for these sectors to have their plans individualized (UNESCO, 2011, p. 6). For Brazil, the shared use of the marine environment in a planned and organized way has been a challenge, due to the dimensions of the national territory, the need of engagement, and the participation of the different sectors acting in the coastal and marine areas (Mattos, 2018, p. 29). Analysing the history of Brazilian law related to the MSP, in 2013, the Interministerial Commission for Sea Resources (ICSR) published the Resolution n°. 1, which approves the creation of a Work Group (WG) for the analysis, study, and proposal of new guidelines and orientation. Besides its institutional, normative, and regulating basis, is also affects the "shared use of the marine environment," preliminarily understood as the rational use of the sea, the marine floors, and its resources, defined by a political process, with support from



technical-scientific parameters. It seeks to harmonize the distinct interests or pressures in that space, aiming to achieve environmental, economic, and social objectives, in a way to contribute to the sustainable development of Brazil in areas under national jurisdiction or control, respecting the safeguard of strategic and National Defence interests. Subsequently, with the publishing of Ordinances n°. 18 and 19, both in 2014, the Secretariat of the Interministerial Commission for Sea Resources (SICSR), WGs were created, respectively, referring to the “MSP” and “Legislation”, to conduct the necessary studies for the implementation of the shared use of the marine environment. It is also worth mentioning the publishing of Ordinance n°. 236/2019, from Brazil’s Navy, regarding the institution of technical groups to assist ICSR. In this Ordinance, a WG necessary to the development of the actions provided for in the plans and programs in force at ICSR was instituted, subordinate to the subcommittee for the Sector Plan for Sea Resources (SPSR), especially for the MSP. In 2020, Ordinance n°. 235, also from the Navy of Brazil, created the “MSP” Executive Committee, subordinated to the Subcommittee for the Sector Plan for Sea Resources, designating its composition. The National Maritime Policy (NMP), instituted by Decree n°. 1.265/1994 is purposed to guide and develop the country’s maritime activities, in an integrated and harmonious way, focusing on the effective, rational, and full use of the sea and inland waterways, and the national interests. It is also conditioned by factors, such as, for instance, government action guidelines, as well as sector policies in their maritime segments. Among the objectives provided for at the NMP, we have, among others, the rational research, exploration, and exploitation of living - in particular regarding food production - and non-living resources of the sea’s water column, bed, and underground, and of sailable rivers, lagoons, and lakes, where commercial activities significant to the maritime power take place; the environment’s protection, in areas where maritime activities are already developed. The National Policy for Sea Resources (NPSR), approved by Decree n°. 5.377/2005, intends to guide the development of activities that aim the effective use and exploration of the living, mineral, and energy resources of the Territorial Waters, the Exclusive Economic Zone, and the Continental Shelf, according to the national interests, rationally and sustainably for the socioeconomic development of the country, generating employment and income, while contributing for social insertion. In consonance with NPSR, Decree n°. 10.544/2020 approves the X Sector Plan for Sea Resources (SPSR), focusing on planning, coordinating, and conducting the activities of the different actors who possess legitimate interests connected to the sea. Thus, as described in the mentioned decree, the execution of the SPSR happens through the development of several actions aimed towards conservation and sustainable exploration of sea resources. These actions are conducted and coordinated by several Ministries and by Brazil’s Navy. The X SPSR is the unfolding of the NPSR, once it seeks to integrate the territorial waters, the exclusive economic zone, and the continental shelf to the Brazilian space, through research activities, oceanographic monitoring, and climate studies, as well as the exploration and conservation of its natural resources. The X SPSR highlights the following topics of interest, among others, for the strengthening of actions aimed towards the implementation of a MSP in the country. Furthermore, promoting the establishment of the country’s marine environment shared use through the implementation of the MSP is also an objective of the X SPSR (Decree n°. 10.544/2020 - item 2, subitem “p”). Therefore, through the MSP, it is a goal to establish the institutional, normative, and regulating bases which may be used in support of the decision-making process related to the use of the sea and its ordering, both in the public and private sphere (Decree n°. 10.544/2020 - item 7.9.1). With regards to “actions to be undertaken,” Decree n°. 10.544/2020 treats in its item 7.9 the MSP, defining the Navy of Brazil, through the Secretariat of the Interministerial Commission for Sea Resources (SICSR), as coordinating organization. In this decree’s topic, item 7.9.2 determines some goals, such as, for example: a) legitimizing the share use of the marine environment in the country; b) performing the assessment of the applicable legislation in force

and the existing legal restrictions that contribute to an adequation proposal of the legal framework; establishing adequate guidelines, tools, and methodologies that may be used in support to the decision-making process related to the sea and its system, both in the public and private sphere; d) developing and coordinating the required actions to the ordering and management of the national marine space, without prejudice to the powers exercised in the scope of a shared management with the other federative bodies, and, whenever necessary, ensuring the due articulation and compatibilization with the system and the management of the terrestrial space; e) promoting the sustainable, rational, and effective economic exploration of the sea resources and the ecosystems' services, ensuring the compatibility and sustainability of several uses and activities developed therein, with capability of supporting the local ecosystem, seeking the creation of employment, the qualification of human resources and the generation of value to the country, through sustainable development; g) identifying, preventing or minimizing eventual conflicts among the uses and activities developed in the national marine space; n) hiring specialized technical consulting for the development of studies on the opportunities and challenges for the effective implementation of the MSP in the country, including suggestions for guidelines and orientations for the development of the referred process in the national territory; q) implementing a pilot project of the MSP in a region of the country that has marine data minimally required to the execution of the aforementioned project, aside from encouraging and promoting the collection of marine data in those regions of the country that still do not have them to, in the future, replicate the MSP pilot project, already in a mature and consistent stage on the other regions of Brazil, among others. In this situation, and according to the presentation of the "The Marine Spatial Planning in Brazil and the perspectives of a pilot project for the country's southern maritime region" (ICSR, 2020), the MSP pilot project is presented for the country's southern region due to some preponderant factors, such as, for instance, the availability of data, it being a representative region, the existence of maritime borders with another country (Uruguay) and the concentration of research institutions with tradition in coastal and marine studies.

### **3. THE SUSTAINABLE DEVELOPMENT GOALS (SDGS) AND THE MSP**

Provided for as an action plan for government, society, companies, and the academy, the 2030 Agenda indicates 17 Sustainable Development Goals, the SDGs, and 169 objectives in which, in 2015, Brazil confirms the adoption of the 2030 Agenda and, subsequently, with the publishing of Decree n°. 8.892/2016, creates the National Commission for the Sustainable Development Goals, with the purpose of internalizing, spreading, and giving transparency to the process of implementation of the 2030 Agenda for the United Nations Sustainable Development, undersigned by Brazil. Goal 14 - Life Below Water - aims to preserve and promote the sustainable use of oceans, seas, and marine resources for sustainable development. However, of the goals stipulated, there are two that have ongoing actions, which take place with the elaboration of the MSP: The first of them is goal 14.2, which until 2020, it is a must to sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including through the reinforcement of its resilience capacity, and to take measures towards its restauration, to ensure healthy and productive oceans. Thus, according to the justification for the adequation of this goal (IPEA, no date), it is informed that Brazil is a country with the privilege of having a huge coastal line that spans more than 8.500 km in length. The global goal and its indicator are applicable to the country, as Brazil needs to sustainably manage and protect this huge heritage, in particular through approaches based on ecosystems. However, it is important to observe that, although Brazil considers approaches based on ecosystems in environmental management, the country does not systematically measure the percentage of the national exclusive economic zone managed in such way, it being necessary, therefore, to implement a monitoring system that gathers the necessary data for the measuring of the original

indicator. The second of them is goal 14.a, in which it is a must to increase scientific knowledge, to develop research capabilities and to transfer marine technology, considering the criteria and guidance on the transfer of marine technology from the Intergovernmental Oceanographic Commission, to improve the oceans health and increase the contribution of marine biodiversity for the development of developing countries, in particular the small insular States in development and less developed countries. Thus, according to the justification for the adequation of this goal (IPEA, no date), it is informed that, on a national level, the Ministry of Science, Technology, Innovations, and Communications has as a function to promote and coordinate the participation of the country in activities from the Intergovernmental Oceanographic Commission (IOC), which is a UNESCO commission related to Oceanic Sciences, according to what is express in the Presidential Decree of the 5<sup>th</sup> of January, 1994. The Navy of Brazil (NB), through the Directorship of Hydrography and Navigation (DHN), is the national institution with the function of promotion and coordinating the participation of the country in IOC activities related to the programs of Oceanic Services, as well as serve as the National Oceanographic Database (NOD) and the OIC's Depository Centre, thus integrating the World System of Oceanographic Data. As verified, the SDG 14 goals (Sustainable Development Goals, no date) are presented with the following status: "produced", "in analysis/construction", "no data" and "does not apply to Brazil". However, in a search conducted on the referred website on November 2021, the goals 14.2 and 14.a are stated as "no data". So, in 2018, by the publishing of the Brazilian Navy's Ordinance n°. 386, in the scope of ICSR, the Work Group (WG) "Sustainable Development Goal 14 (SDG 14) - Life Below Water" was created, established by Resolution ICSR n°. 2/2018, coordinated by the Ministry of Science, Technology, Innovations, and Communications (MSTIC), with the purpose of contributing, discussing, and following the implementation of ten goals of the Sustainable Development Goal 14. And within what is provided for in X SPSR, referring to the specific chapter on the MSP, some goals were created related to the SDGs, such as, for example, assisting in the implementation of the SDG 14 goals, aiming towards the conservation and sustainable use of oceans, seas, and marine resources, among others that were listed.

#### **4. BILL N°. 6.969/2013 DISCUSSION: NATIONAL POLICY FOR THE CONSERVATION AND SUSTAINABLE USE OF THE BRAZILIAN MARINE BIOME (NPCMAR)**

In spite of not yet having a MSP effectively implemented in Brazil, whether it is national or regional, the MSP became a globally accepted process, and its implementation has been suggested to reach the goals of the UN's 2030 Agenda SDG 14 (Gerhardinger et al, 2019, p. 5). Until now, there was no "legal definition" of MSP in Brazil, even in a Law Bill. Taking advantage of the history of the existing public policies for zoning of use and activities in the CZ, the Law Bill n°. 6.969/2013 was presented at the House of Representatives, which "Institutes the National Policy for the Conservation and Sustainable Use of the Brazilian Marine Biome (NPCMAR)". So, the referred Bill demonstrates the need to create a planning process of ordering of the activities carried out in the marine territory, in the context of ICZM, through the MSP, with the intent of reducing and also harmonizing the conflicts existing therein among the actors who exercise their activities, promoting compatible uses and preserving ecosystem services, thus reaching the environment, economic, and social goals. Within the structure presented in the Bill, guidelines for the formulation and execution of norms, plans, programs, projects, and actions regarding NPCMar are constituted, among others, the adoption of the integrated MSP, which meet the criteria of replicability, representativity, vulnerability, irreplaceability, flexibility, complementarity, persistence, and of principles of efficiency, social participation, adaptability, and transparency. Chapter II, which deals with instruments, capacities, and governance, determines that, among others provided for, the national and

regional MSP constitute NPCMar's instruments. Since is first presenting, on 17/12/2013, and its last amendment, proposed on 16/03/2021, the Bill has gone through some changes of the utmost importance, verified as follows: The first one which refers to article 7, § 1<sup>st</sup> of the initial version determines that the "national and regional MSP, the quality and environmental health indicators, and the goals to which subitems I, II, and III of this article's head provision treats must be the object, prior to its coming into force, of regional public hearings promoted on the scope of the National Council of Environment (NCE) and must be updated at the maximum of every five years". So, these items, comprehended on Title II - Instruments, capacities, and governance of NPCMar are not contained in the last version of the substitute for the Bill presented on 16/03/2021. However, on a federal level, the NCE Resolution n°. 09/1987 provides for the execution of public hearings and its purpose is to expose to the interested parties the content of the product in analysis, answering questions and collecting from those present the criticism and suggestions regarding it. On the part referring to the national and regional MSP, the Bill itself defines the MSP as being a "broad, adaptive, integrated, ecosystemic, transparent, participative spatial planning process grounded on scientific knowledge to assess and distribute human activities spatially and temporally in the marine biome, to identify the most suitable areas for the diverse types of activities, reduce environmental impacts and conflicts among uses, promote compatible usage, and preserve ecosystem services, reaching the environmental, economic, and social goals". So, if in its concept, the MSP is a "transparent and participative" process, besides "reducing environmental impacts and conflicts among uses, promoting compatible usage and preserving ecosystem services, reaching environmental, economic, and social goals," these characteristics do not match the absence of public hearings taking place. According to Dantas (2012), holding public hearings is an essential democratic instrument for the effective and informed popular participation. Therefore, in front of its relevance to inform and receive contributions from the population, public hearings must take place unrestrictedly. There is no risk towards the environment in its execution. Trying to stop them hurts the democratic principle, only being of interest to those who wish to silence society, restrict free initiative and, therefore, prevent the informed and sustainable development of the country. For Violante, Da Costa and Leonardo (2021, p.62), besides dealing with the dimensions of national territory, the MSP supposes the engagement and participation of different acting sectors in the national marine spaces. This support tool for sea policies, programs, and projects require integration from the state strategic standpoint, not governmental, by engaging several perennial institutions of Brazilian society. A point that deserves greater attention in the Bill, making the amendment in Law n°. 7.661/1988 (NPCM), regarding its 5<sup>th</sup> article, in their 1<sup>st</sup> and 2<sup>nd</sup> paragraphs, is that the referred project would take from the municipalities the capacity to institute their respective CPCM. So, in these cases, only the states shall institute, by law, the respective SPCM, considering the norms and guidelines of the NPCM and what is provided in this law, and designate competent bodies for the execution of these plans (Prearo Junior et al., 2021, p. 518). Furthermore, it was also determined that municipalities which have their own plans of coastal management have two years to legally edit the Master Plan dealing with this article, under the penalty of being prevented from having access to federal resources of any nature. Thus, due to retrieving the "capacity" from coastal cities, in virtue of the proposed "extinction" of the CPCM, in executing and taking part in the integrated management, together with the national and state plans, how do we build guidelines for the formulation and execution of norms, plans, programs, projects, and actions related to the NPCMar, provided for in the 5<sup>th</sup> article of the Bill, without the role of the coastal municipality and its respective CPCM? What would be the real impact, in practice, of this "absence" of the city in the ICZM? The CPCM is the instrument described in Decree n°. 5.300/2004 to implement the City Policy for Coastal Management, defining the institutional responsibilities and procedures for its execution. The X SPSR, by focusing on, among other topics of interest, the strengthening of actions aiming at the

implementation of a MSP in the country, ratifies with the legal context described in the Bill, considering the need for adoption, by the country, of an integrated MSP, by promoting the establishment of the shared use of marine environment, thus contributing to the reduction of environmental, social, and economic vulnerabilities of the CZ.

## **5. THE EXAMPLE OF THE ORDERING AND MANAGEMENT MODEL OF PORTUGAL'S MARITIME SPACE**

Portugal is an oceanic country, with a coastal line of around 2.500 km, counting with one of the largest Exclusive Economic Zones in the world, which spans 1.7 million km<sup>2</sup>, including a large diversity of ecosystems and resources. The Portuguese maritime triangle (continental Portugal, Madeira, and Azores) constitutes 48% of all marine waters under jurisdiction of the European Union (EU) Member-States in adjacent spaces to the European continent (Portuguese Republic Government, 2021, p. 23). The National Strategy for the sea defines Portugal as a nation that wishes to reach economic and social growth, in which all five of the nation's regions are coastal (De Freitas et al, 2014, p. 28). The Ministry of Agriculture and Sea is responsible for the MSP, thus verifying that the mentioned planning is not directly associated to the environment. A specific policy for the sea was created in Portugal on five pillars, which are: blue growth, growth data, ordering of the maritime space, integrated surveillance of the maritime space in the context of ensuring safety for activities and a strategy per basins. There is, within the blue economy, a perspective of creating jobs, creating economy and innovation in the optic of sustainability (de Freitas et al, 2014, p. 27). Currently, the MSP is a theme that has been growing globally, especially in European countries, as in June 2014, the European Parliament published a directive (Directive 2014/89/EU) that establishes a framework for the ordering of maritime space. It is worth highlighting that the MSP is one of the five policies encompassed by the European Union's Integrated Maritime Policy (IMP). This IMP, created in 2009, consists of a set of policies related to the marine environment, whose purpose is to promote sustainable growth through the integration and coordination of the many maritime sectors and their respective actors, increasing the capacity of creating integrated solution to marine challenges (Gern, 2017, p. 45). Following European policies, the global awareness towards the importance of coastal zones and the principles defined in Agenda 21, Portugal approves the law-decree n°. 309/1993, which regulates the elaboration and approval of the waterfront ordering plans (WOP), which are intended to promote the coastal zones management. Subsequently, law-decree n°. 151/1995 is approved, which puts the waterfront ordering plans, the public waters reservoir ordering plans (ROP) and the protected areas ordering plans (PAOP) within a special set of plans, the territory ordering special plans (TOSP) (Casimiro, 2015, p. 25). In 2009, according to dispatch n°. 32277/2008 of the Presidency of Ministries started the process of elaboration and determination of the Maritime Space Ordering Plan (MSOP). According to Casimiro (2015, p. 29), the MSOP comes into scene as a sector plan for the sea, whose elaboration would have to follow the norms defined in the legal regimen of the territory management instruments. In April 2014, the new regimen of management of ordering of the Portuguese maritime space was approved as an answer to the request for extension of the Portuguese continental shelf. This new law establishes the bases for the ordering and management policy of the Portuguese maritime space, with the purpose of ensuring the good organization and use of the space, safeguarding its resources, and aiming at the country's sustainable development (Casimiro, 2015, p. 17). So, Law n°. 17/2014 establishes the bases of the Ordering and Management Policy of the National Maritime Space (OMPNMS). One of the objectives of the ordering and management of the national maritime space is the promotion of the effective, rational, and sustainable exploration of marine resources and ecosystem services, ensuring the compatibility and sustainability of the many uses and activities developed in it, meeting the inter and intragenerational responsibility in the use of the national maritime space

and seeking the creation of employment (Law n°. 17/2014, 4<sup>th</sup> art.). Thus, the ordering and management system of Portugal's national maritime space encompasses the strategic instruments of the ordering and management policy of the national maritime space, namely the National Strategy for the Sea and the ordering instruments of the national maritime space, such as the situational Plans and allocation Plans (Law n°. 17/2014, article 7) As described in Law-Decree n°. 38/2015, which develops Law n°. 17/2014, that establishes the Bases for the Ordering and Management Policy of the National Maritime Space (OMPNMS), the ordering is executed, at first, by the situational plan containing, namely, the identification of the protection and preservation sites of the marine environment and the spatial and temporal distribution of the existing and potential uses and activities. The situational plan, which presents itself as a portrait, current and potential, of the national maritime space, may be elaborated step by step. The allocation plans configure the other ordering instrument, proceeding to the allocation of areas and/or volumes of the national maritime space to uses and activities not identified in the situational plan. The allocation plan, as soon as approved, is automatically integrated to the situational plan. The OMPNMS still determines the preference criteria used in the determining of the main use or activity when a case of ongoing or developing conflict between uses or activities is verified in the national maritime space. Thus, the following preference criteria are followed: a) greater social and economic advantage to the country, in particular the creation of jobs and qualification of human resources, by the creation of value and by the contribution for sustainable use; and b) maximum coexistence of uses or activities (Law n°. 17/2014, article 11). This last criterion shall only be applied when an equality of results in the first criterion is found. For Casimiro (2015, p. 35), the preference of a use or activity presented in an allocation plan may lead to the relocation of existing uses or activities in case it is not possible to perform the new use or activity in another area or volume of the national maritime space. In this context, the stakeholders in developing the new use or activity which promoted the relocation of the previous shall bear the costs associated to the relocation of the existing activity. The relocation may also be performed whenever the public interest is concerned, in particular by environmental issues, the allocation plan may determine the relocation of the existing uses and activities, with the State bearing the costs except if the relocation arises out of the occurrence of natural causes that put the safety of people, property, or the environment at risk. However, no matter that their management and ordering tools for the maritime space, the articulation between the instruments of territory management and the ordering instruments of the maritime space is necessary. For Casimiro, (2015, p. 37), it is extremely important, especially with regards to the coastal zone, the success of the maritime ordering and safeguarding of marine and coastal resources and natural values depends of the existence of a harmony and recognition between both territory management systems, it being essential for a good management of the space to be achieved with a minimum of conflicts, especially in the coastal zone, where most economic activities are concentrated. In this context, ensuring the compatibility of programs and plans of both ordering regimes becomes central.

## 6. CONCLUSION

We verified that Brazil still does not have a MSP implemented, we have already advanced by verifying the existence of a pilot project for its implementation in the country's southern region. Achieving and maintaining the balance of the economic, social, and environmental goals of the activities conducted in the CZ together with their actors is a great national challenge. By comparing the beginning of the process of implementation of the MSP in Brazil, with the experience of Portugal, we first verified that the X SPSR and the Bill do not initially deal with preference criteria in situations of conflict of uses or activities in a same region, while Portugal, in its ordering and management system of the national maritime space, provided for at OMPNMS, contemplates for situations of conflict between uses or activities, preference criteria

in the determination of the use of activity, such as the greater social and economic advantage for the country (creation of jobs and qualification of human resources, for the creation of value and contribution towards sustainable development) and, secondarily, the maximum coexistence of uses or activities. As we can imagine a peaceful shared use of the marine environment by the many actors who develop and perform their activities there, the criterion used by Portugal is very clear, which may make easier for a better ICZM, in virtue of the possibility of a preference for a use or activity for the above-mentioned preference criteria occur, even being able to imply the relocation of ongoing uses or activities. The creation and establishment of a management plan of the marine space, aside from ushering in greater legal security, is a more rational form of organization for the use of the marine space and the interactions among its uses. The MSP is a public and participative process which must count with the inclusion and engagement of all actors involved, with the purpose of maintaining ecosystem services to provide significant economic, environmental, and social benefits. As the next steps, we expect the results, as soon as possible, of the implementation of the MSP pilot project in the country's southern region and its respective maturing, so that in the near future, its performance is monitored and assessed, correcting any necessary points, to that it may be reproduced on the other coastal regions of Brazil.

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## THE BALKAN COUNTRIES FISCAL AND MONETARY POLICY EFFECTIVENESS IN THE CONTEXT OF THE MUNDELL-FLEMING MODEL

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### ABSTRACT

*The economic growth can be stimulated by pursuing two types of policies - expansionary fiscal or expansionary monetary policy. According to the Mundell-Fleming model, the implementation of each of these policies has different effectiveness depending on the exchange rate regime applied. In countries with a fixed exchange rate, economic growth is influenced by fiscal policy (mainly through government spending), and in countries with a floating exchange rate, monetary policy (mainly through the growth of money supply) has an impact. The present study aims to verify through cointegration analysis: a. whether there is a long-term relationship between the monetary aggregate and economic growth in the Balkan countries with a floating exchange rate regime (i.e. whether monetary policy is effective), and b. whether there is a long-term relationship between government spending and economic growth in countries with fixed exchange rates (i.e. whether fiscal policy is effective). The Balkan countries are divided into two groups – the first one includes countries applying a floating exchange rate for most of the period 2004-2018 and the second one includes countries applying a fixed exchange rate.*

**Keywords:** *Cointegration analysis, Fiscal policy, Monetary policy, Mundell-Fleming model*

### 1. INTRODUCTION

Economic growth can be stimulated mainly through two types of policy - expansionary fiscal policy or expansionary monetary policy. Theoretically, under an expansionary fiscal policy, the government can have a positive impact on the economy by cutting taxes or mainly by increasing government spending, while under an expansionary monetary policy, the central bank can try to stimulate the economy, albeit temporarily, by increasing the money supply. The two types of economic policy are widely used in all countries, both together and separately. However, according to the Mundell-Fleming model, the effect of their application will differ, depending on the choice of the exchange rate arrangement. Developed in the 1960s by Marcus Fleming (Fleming, 1962) and Robert Mundell (Mundell, 1963), the model is an extension of the IS-LM model and originally considered a small open economy in which international capital movements and trade were added to the commodity and money markets of the IS-LM model. The development of the main ideas in the model over the years has led to the formation of two hypotheses. In countries with fixed exchange rates, economic growth is influenced by fiscal policy (mainly through government spending), while in countries with floating exchange rates, it is influenced by monetary policy (mainly through money supply growth) (Obstfeld, 2001). The present study tests, through cointegration analysis, the hypothesis whether, for the Balkan countries with a floating exchange rate arrangement, there is a long-term relationship between

monetary aggregate and economic growth, i.e. whether monetary policy is effective, and for the countries with a fixed exchange rate arrangement, whether there is a long-term relationship between government spending and economic growth, i.e. whether fiscal policy is effective. For the purposes of analysis, it uses the classification adopted in the IMF *Annual Report on Exchange Arrangements and Exchange Restrictions* for the period 2004-2020, dividing the countries into two groups according to their exchange rate arrangement – those with a floating exchange rate for most of the period 2004-2018 (Albania, Serbia (until 2018), Turkey, Romania (until 2018), Greece, Slovenia, Montenegro and Kosovo) and with a fixed exchange rate (Bulgaria, Bosnia and Herzegovina, Croatia, North Macedonia).

## 2. METHODOLOGY OF THE STUDY

The present study will use the data on GDP growth (as a percentage, annual data), government spending (as a percentage of GDP, annual data), broad money (monetary aggregate M3, as a percentage of annual growth/decline) for the Balkan countries - Bulgaria, Greece, Croatia, Romania, Slovenia, Montenegro, North Macedonia, Albania, Serbia, Turkey, Bosnia and Herzegovina and Kosovo. The scope of the study covers the period 2004-2020. The data source for GDP growth is Eurostat, and for the periods where Eurostat does not have GDP growth data for some non-EU countries (Albania, Montenegro, Kosovo), the data are supplemented with World Bank data (*World Bank National Accounts Data*, World Development Indicators). The source for data on government expenditure is the International Monetary Fund (IMF), *World Economic Outlook Database* (April 2021); for the broad money indicator, data for Greece and Slovenia were sourced from the national central banks, for the rest of the countries, the sources used are the IMF, *International Financial Statistics* and data files, and for Montenegro and Kosovo, data from the World Bank were used in addition to the IMF data. The econometric software Eviews, v.12, and the Johansen cointegration test were used in the analysis. Cointegration analysis is used to reveal a long-term relationship between non-stationary variables (Kovachevich, 2016), i.e. data where there is a trend and the time series of most macroeconomic variables are non-stationary. In the case of non-stationary source data, it is not possible to apply classical regression analyses to reveal a relationship between variables (Granger and Newbold, 1974); hence, cointegration analysis is used instead. In its application, the baseline data need to be first-order integrated (Engle and Granger, 1987), i.e., the data need to be transformed to stationary (no "trend", time-independent) using their first differences. An Augmented Dickey-Fuller (ADF) test is therefore used in order to identify the integration order of the source data on GDP growth, government spending and broad money of the Balkan countries.

### 2.1. Conducting a cointegration analysis

Conducting the Dickey-Fuller test requires a preliminary check for the presence of a "constant" and/or "trend" in the raw data. The check revealed the presence of the "trend" and "constant" components in the economic growth rate series for Albania, Bosnia and Herzegovina, Bulgaria and North Macedonia (Table 1). In the series for Kosovo, Serbia, Turkey, Romania and Montenegro, there is only a "constant", and the remaining series (Greece, Croatia and Slovenia) are without any "constant" or "trend". The government expenditure series of Albania, Bulgaria, Croatia, Greece, North Macedonia, Romania, Serbia, Slovenia and Turkey contain only a "constant", while Bosnia and Herzegovina, Kosovo and Montenegro have a "trend" as well. Finally, the time series of the broad monetary aggregate for each country were also tested, and the results showed that, for Greece and Slovenia, there is neither a "constant" nor a "trend"; for Croatia and Turkey, there is only a "constant", and for the remaining countries, there are both a "constant" and a "trend".

<i>Variable</i>	<i>Without constant and trend</i>	<i>Constant</i>	<i>With constant and trend</i>
<b><i>GDP growth rate(%)</i></b>	Croatia Greece Slovenia	Kosovo Montenegro Romania Serbia Turkey	Albania Bosnia and Herzegovina Bulgaria North Macedonia
<b><i>General government total expenditure (% of GDP)</i></b>		Albania Bulgaria Croatia Greece North Macedonia Romania Serbia Slovenia Turkey	Bosnia and Herzegovina Kosovo Montenegro
<b><i>Broad Money (annual growth, %)</i></b>	Greece Slovenia	Croatia Turkey	Albania Bosnia and Herzegovina Bulgaria Kosovo Montenegro North Macedonia Romania Serbia

*Table 1: Check for constant and trend in the source data  
(Source: Author's calculations)*

The Augmented Dickey-Fuller (ADF) test is used to identify at which order the source data on GDP growth, government spending and broad money of the Balkan countries are integrated. The Akaike information criterion is used in selecting the lag for conducting the ADF test. The results of the test are presented in Table 2.

*Table following on the next page*

Country	Hypothesis	GDP growth rate(%)	General government total expenditure	Broad Money
		Sig. Level	Sig. Level	Sig. Level
Bulgaria	I. $H_0$ (Non-Stationary Time Series Data) $H_1$ (Stationary Time Series Data)	0.4216>0.05, Non-Stationary Time Series Data	0.0711>0.05, Non-Stationary Time Series Data	0.0547>0.05, Non-Stationary Time Series Data
	II. $H_0$ (Non-Stationary first differences) $H_1$ (Stationary first differences)	<b>0.01&lt;0.05, 1<sup>st</sup> order of integration</b>	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b>	<b>0.01&lt;0.05, 1<sup>st</sup> order of integration</b>
Greece	I. $H_0$ (Non-Stationary Time Series Data) $H_1$ (Stationary Time Series Data)	0.1428>0.05, Non-Stationary Time Series Data	0.5210>0.05, Non-Stationary Time Series Data	0.1094>0.05, Non-Stationary Time Series Data
	II. $H_0$ (Non-Stationary first differences) $H_1$ (Stationary first differences)	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b>	<b>0.04&lt;0.05, 1<sup>st</sup> order of integration</b>	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b>
Croatia	I. $H_0$ (Non-Stationary Time Series Data) $H_1$ (Stationary Time Series Data)	<b>0.0359&lt;0.05, Stationary Time Series Data</b>	0.0827>0.05, Non-Stationary Time Series Data	0.1874>0.05, Non-Stationary Time Series Data
	II. $H_0$ (Non-Stationary first differences) $H_1$ (Stationary first differences)		<b>0.03&lt;0.05, 1<sup>st</sup> order of integration</b>	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b>
Romania	I. $H_0$ (Non-Stationary Time Series Data) $H_1$ (Stationary Time Series Data)	0.1091>0.05, Non-Stationary Time Series Data	0.2601>0.05, Non-Stationary Time Series Data	0.9586>0.05, Non-Stationary Time Series Data
	II. $H_0$ (Non-Stationary first differences) $H_1$ (Stationary first differences)	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b>	<b>0.1096&gt;0.05, higher order of integration</b>	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b> (Lag=2, max=2)
Slovenia	I. $H_0$ (Non-Stationary Time Series Data) $H_1$ (Stationary Time Series Data)	<b>0.0186&lt;0.05, Stationary Time Series Data</b>	0.1887>0.05, Non-Stationary Time Series Data	<b>0.0318&lt;0.05, Stationary Time Series Data</b>
	II. $H_0$ (Non-Stationary first differences) $H_1$ (Stationary first differences)		<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b>	
Montenegro	I. $H_0$ (Non-Stationary Time Series Data) $H_1$ (Stationary Time Series Data)	0.1811>0.05, Non-Stationary Time Series Data	0.2535>0.05, Non-Stationary Time Series Data	0.0988>0.05, Non-Stationary Time Series Data
	II. $H_0$ (Non-Stationary first differences) $H_1$ (Stationary first differences)	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b>	<b>0.03&lt;0.05, 1<sup>st</sup> order of integration</b>	<b>0.02&lt;0.05, 1<sup>st</sup> order of integration</b> (Lag=1, max=2)
North Macedonia	I. $H_0$ (Non-Stationary Time Series Data) $H_1$ (Stationary Time Series Data)	0.1722>0.05, Non-Stationary Time Series Data	0.0790>0.05, Non-Stationary Time Series Data	0.9225>0.05, Non-Stationary Time Series Data
	II. $H_0$ (Non-Stationary first differences) $H_1$ (Stationary first differences)	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b>	<b>0.02&lt;0.05, 1<sup>st</sup> order of integration</b>	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b>
Albania	I. $H_0$ (Non-Stationary Time Series Data) $H_1$ (Stationary Time Series Data)	0.1783>0.05, Non-Stationary Time Series Data	0.5665>0.05, Non-Stationary Time Series Data (Lag=5, max=6)	0.9993>0.05, Non-Stationary Time Series Data
	II. $H_0$ (Non-Stationary first differences) $H_1$ (Stationary first differences)	<b>0.1730&gt;0.05, higher order of integration</b>	<b>0.2401&gt;0.05, higher order of integration</b>	<b>0.0870&gt;0.05, higher order of integration</b>
Serbia	I. $H_0$ (Non-Stationary Time Series Data) $H_1$ (Stationary Time Series Data)	<b>0.0468&lt;0.05, Stationary Time Series Data</b>	0.1430>0.05, Non-Stationary Time Series Data	0.1426>0.05, Non-Stationary Time Series Data
	II. $H_0$ (Non-Stationary first differences) $H_1$ (Stationary first differences)		<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b>	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b>
Turkey	I. $H_0$ (Non-Stationary Time Series Data) $H_1$ (Stationary Time Series Data)	0.0624>0.05, Non-Stationary Time Series Data	0.2915>0.05, Non-Stationary Time Series Data (Lag=4, max=5)	0.9968>0.05, Non-Stationary Time Series Data
	II. $H_0$ (Non-Stationary first differences) $H_1$ (Stationary first differences)	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b>	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b>	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b> (Lag=0, max=1)
Bosnia and Herzegovina	I. $H_0$ (Non-Stationary Time Series Data) $H_1$ (Stationary Time Series Data)	0.4168>0.05, Non-Stationary Time Series Data	0.3440>0.05, Non-Stationary Time Series Data	0.2832>0.05, Non-Stationary Time Series Data
	II. $H_0$ (Non-Stationary first differences) $H_1$ (Stationary first differences)	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b>	<b>0.04&lt;0.05, 1<sup>st</sup> order of integration</b>	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b> (Lag=4, max=4)
Kosovo	I. $H_0$ (Non-Stationary Time Series Data) $H_1$ (Stationary Time Series Data)	0.3469>0.05, Non-Stationary Time Series Data	0.3819>0.05, Non-Stationary Time Series Data	0.9999>0.05, Non-Stationary Time Series Data
	II. $H_0$ (Non-Stationary first differences) $H_1$ (Stationary first differences)	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b>	<b>0.03&lt;0.05, 1<sup>st</sup> order of integration</b> (Lag=1, max=2)	<b>0.00&lt;0.05, 1<sup>st</sup> order of integration</b> (Lag=0, max=4)

Table 2: Augmented Dickey-Fuller stationary test results  
(Source: Author's calculations)

The results from the Dickey-Fuller stationarity test show that the source data on GDP growth for Serbia, Slovenia and Croatia are stationary, while the data for Albania are integrated at a higher order. The source data on government expenditure for Albania and Romania are integrated at a higher order, and so are the data on broad money in Albania, while the broad money data for Slovenia are stationary. The data for all of the remaining countries are non-stationary, and in particular, they are first-order integrated, i.e. the first differences in the source data are stationary. This enables the application of the Johansen cointegration test to all countries except the said five countries. Although they fail to meet the qualification conditions for the Johansen cointegration analysis, those five countries will still be included in it, yet it would not be appropriate to subject the results for those countries to any interpretation.

## 2.2. Literature Review

Since the creation of the Mundell-Fleming model in the early 1960s, with the publications of R. Mundell from 1960-1964 and M. Fleming from 1962, the model has given rise to numerous debates, and its core ideas are applied in the governance of monetary and fiscal policies to this day. Nearly a quarter of a century following the emergence of the model, Frenkel (1987) discussed its application, pointing out the difference between short-term and the long-term effects of fiscal and monetary policies, noting the consequences of financing government expenditure through taxes, and the role of the exchange rate arrangement in the successful application of those policies, as well as in terms of the trade balance. In the following years, research involving the model has explored in detail both the model's essence and assumptions and the main "trilemma", or the „impossible trinity" set forth in it, according to which a country cannot maintain a fixed exchange rate, free movement of capital and an independent monetary policy all at the same time. A considerable part of the research has also been devoted to the concrete application of the model in specific countries or regions. Huh (1999) applies the model to data for Australia and finds that almost all of the model's predictions are applicable to that country. Hsing (2020) arrives at similar conclusions by applying the model to Chile. The author finds that expansionary fiscal policy reduces production output while monetary expansion increases production output, and almost all of the model's predictions are also applicable to Chile. Vidakovic (2005) focuses on fiscal and monetary policies and applies the model to data for Croatia, and his results show that applying monetary and fiscal policies separately does not have a positive effect on the economy. Ortiz and Rodríguez (2002) focus on Argentina and propose a modified model whose main results are applicable to other emerging economies with fixed exchange rates and free movement of capital. Ramanathan and Teng (2013) examine the Mundell-Fleming model in the context of capital mobility management in emerging Asian economies and the ways in which central banks and financial regulators in the region ensure smooth signal transmission to exchange rates in the monetary policy transmission mechanism. Souza and Ledrut (2002) extend the model by applying it to countries that are about to join the European Union and are looking for the optimal exchange rate arrangement before accession, whether fixed or floating. For most of the countries examined, a floating exchange rate is found to be more appropriate. Kovachevich (2021) examines cointegration analysis application to find a long-term relation among eurozone economic growth and the Balkan countries growth and "the results of Johansen's cointegration test show that there is a longterm relationship between the GDP growth in the euro area and that in some of the Balkan economies".

## 3. RESULTS OF THE APPLICATION OF A COINTEGRATION ANALYSIS

Cointegration analysis was applied in two stages. In the first stage, the long-term relationship between GDP growth and government spending was tested (Table 3). In order to confirm the Mundell-Fleming hypothesis for the countries with floating exchange rates (Albania, Serbia (until 2018), Turkey, Romania (until 2018), Greece, Slovenia, Montenegro and Kosovo), there

should be no long-term relationship between the two variables. Conversely, for countries with a fixed exchange rate (Bulgaria, Bosnia and Herzegovina, Croatia, North Macedonia), according to the Mundell-Fleming model, there will be a long-term relationship between GDP growth and government spending.

<i>Country</i>	<i>Lags</i>	<i>Hypothesized No. of Cointegration Equation(s)<sup>1</sup></i>	<i>Trace Statistic</i>	<i>Critical Value 0.05</i>	<i>Probability<sup>2</sup></i>	<i>Long-run relation</i>
<i>Floating exchange rate countries</i>						
<i>Romania</i>	1	None	11.6675	20.26184	0.4791	No
		At most 1	4.84357	9.164546	0.3010	
<i>Greece</i>	3	None	8.02366	12.32090	0.2348	No
		At most 1	0.45605	4.129906	0.5629	
<i>Kosovo</i>	1	None	21.2683	25.87211	0.1684	No
		At most 1	7.10096	12.51798	0.3341	
<i>Montenegro</i>	1	None	24.4940	25.87211	0.0735	No
		At most 1	6.95259	12.51798	0.3495	
<i>Slovenia</i>	3	None	11.5085	12.32090	0.0681	No
		At most 1	0.02064	4.129906	0.9065	
<i>Turkey</i>	3	None	12.7685	20.26184	0.3826	No
		At most 1	5.57257	9.164546	0.2264	
<i>Serbia</i>	1	None	14.9828	20.26184	0.2273	No
		At most 1	5.39444	9.164546	0.2429	
<i>Albania</i>	3	None	35.4493	15.4947	0.0000	Yes
		At most 1	0.38614	3.8414	0.5343	
<i>Fixed exchange rate countries</i>						
<i>Bulgaria</i>	3	None	16.1352	15.4947	0.0400	Yes
		At most 1	5.18367	3.8414	0.0228	
<i>Croatia</i>	3	None	25.9409	15.4947	0.0010	Yes
		At most 1	10.0580	3.8414	0.0015	
<i>Bosnia and Herzegovina</i>	1	None	18.5100	18.39771	0.0482	Yes
		At most 1	4.06555	3.841465	0.0438	
<i>North Macedonia</i>	3	None	26.0742	25.87211	0.0472	Yes
		At most 1	5.85563	12.51798	0.4789	

*Table 3: Johansen Cointegration Test Results for GDP Growth-Government Expenditure Relation*

*(Source: Author's calculations)*

The results of the cointegration analysis at the first stage show that the hypothesis of the Mundell-Fleming model is confirmed: in all countries (except Albania) with floating exchange rates there is no long-term relationship between GDP growth and government spending, while in countries with fixed exchange rates there is a long-term relationship between the two variables. However, the results for Albania, Croatia, Romania, Serbia and Slovenia do not yield to interpretation, as they do not qualify for inclusion in the Johansen cointegration analysis.

<sup>1</sup> "None" indicates no long-run relationship between the variables.

<sup>2</sup> The significance level (probability) must be less than 0.05 in order to accept the alternative hypothesis that there is a long-run relationship between the variables.



In the second stage, the long-term relationship between GDP growth and broad money is tested (Table 4). In order to confirm the hypothesis of the Mundell-Fleming model for the countries with floating exchange rates (Albania, Serbia (until 2018), Turkey, Romania (until 2018), Greece, Slovenia, Montenegro and Kosovo), this time there should be a long-term relationship between the two variables. Conversely, for countries with fixed exchange rates (Bulgaria, Bosnia and Herzegovina, Croatia, North Macedonia), according to the Mundell-Fleming model, there will be no long-term relationship between GDP growth and the broad monetary aggregate.

<i>Country</i>	<i>Lags</i>	<i>Hypothesized No. of Cointegration Equation(s)<sup>3</sup></i>	<i>Trace Statistic</i>	<i>Critical Value 0.05</i>	<i>Probability<sup>4</sup></i>	<i>Long-run relation</i>
<i>Floating exchange rate countries</i>						
<i>Romania</i>	2	None	32.1450	25.87211	0.0072	Yes
		At most 1	10.6738	12.51798	0.0997	
<i>Greece</i>	2	None	14.4611	12.32090	0.0216	Yes
		At most 1	0.96842	4.129906	0.3769	
<i>Kosovo</i>	3	None	47.3287	25.87211	0.0000	Yes
		At most 1	16.1059	12.51798	0.0120	
<i>Montenegro</i>	1	None	27.0458	25.87211	0.0356	Yes
		At most 1	6.52248	12.51798	0.3970	
<i>Slovenia</i>	1	None	27.4853	25.87211	0.0313	Yes
		At most 1	9.18317	12.51798	0.1694	
<i>Turkey</i>	3	None	55.9347	20.26184	0.0000	Yes
		At most 1	13.7360	9.164546	0.0064	
<i>Serbia</i>	3	None	39.3263	18.39771	0.0000	Yes
		At most 1	5.31937	3.841465	0.0211	
<i>Albania</i>	2	None	16.7899	18.39771	0.0828	No
		At most 1	5.96426	3.841465	0.0146	
<i>Fixed exchange rate countries</i>						
<i>Bulgaria</i>	1	None	13.6050	18.39771	0.2058	No
		At most 1	3.51229	3.841465	0.0609	
<i>Croatia</i>	3	None	36.2459	18.39771	0.0001	Yes
		At most 1	7.25132	3.841465	0.0071	
<i>Bosnia and Herzegovina</i>	3	None	89.3455	18.39771	0.0000	Yes
		At most 1	14.4860	3.841465	0.0001	
<i>North Macedonia</i>	1	None	14.4322	18.39771	0.1644	No
		At most 1	2.52986	3.841465	0.1117	

*Table 4: Johansen Cointegration Test Results for GDP Growth-Broad Money Relation  
(Source: Author's calculations)*

The results of the cointegration analysis at the second stage also confirm the hypothesis of the Mundell-Fleming model: in all countries with floating exchange rates (except Albania) there is a long-term relationship between GDP growth and the broad monetary aggregate, while in countries with fixed exchange rates (except Croatia and Bosnia and Herzegovina) there is no

<sup>3</sup> "None" indicates no long-run relationship between the variables.

<sup>4</sup> The significance level (probability) must be less than 0.05 in order to accept the alternative hypothesis that there is a long-run relationship between the variables.

long-term relationship between the two variables. Here again, however, one should not interpret the results for Albania, Croatia, Romania, Serbia and Slovenia as they do not qualify for inclusion in Johansen's cointegration analysis.

#### 4. CONCLUSION

The results of Johansen's cointegration analysis applied to the data on GDP growth, government spending and broad money indicators for the Balkan countries confirm the hypotheses of the Mundell-Fleming model. The analysis shows that, for countries with a floating exchange rate arrangement, there is a long-term relationship between monetary aggregate and economic growth, i.e. monetary policy has an effect on the economy, while for countries with a fixed exchange rate arrangement there is a long-term relationship between government spending and economic growth, i.e. a fiscal policy is effective.

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# FITTING TRANSGRESSIVE VARIABLES INTO FINANCIAL MODELS IN EASTERN CROATIA

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## ABSTRACT

*The purpose of this paper is to examine the possibilities of fitting distinct transgressive variables in an underdeveloped context of financial econometric models based and set up in the Eastern counties of the Republic of Croatia. Generally, this paper is designed and implemented at the first stage of training a vector machine learning model for identifying, improving and enhancing the condition of financial subsystems in emerging counties of Croatia, which is of great importance to the progress of Croatian regions with below-average contribution to the overall national inflation-adjusted GDP. The research question of this paper asks if establishing a general framework of integrating dissimilar transgressive variables into advanced econometric models is feasible in the underdeveloped regions, and if so, to prepare the setting for the next stage of the project which this paper is a part of, and from which it stems. The test variables were computationally selected from FRED online economic database and analysed with STATA and EViews econometric software by Support Vector Machines (SVM) modelling with application of sigmoid kernels for the SVM model. Furthermore, Bayesian VAR with the Normal-Wishart prior type and symmetric long-run covariance with quadratic-spectral kernel and Newey-West automatic specifications were also estimated. The high adjusted R-squared, along with other results, imply that there are highly probable possibilities of integration and optimization of transgressive variables, even when the situation of financial econometric modelling is sub-optimal, as it is in the Eastern Croatia, and that further analysis should be pursued along the proposed course.*

**Keywords:** *Bayesian vector autoregression, Eastern Croatia, financial subsystems, machine learning*

## 1. INTRODUCTION

There is an ongoing debate regarding the usage and application of subprime quality datasets in the context of underdeveloped economic regions (Stoica, Trif and Visoiu, 2013; Kuncic, 2014; Rosli, Tempero and Luxton-Reilly, 2018)), such as of Eastern Croatia, but also in the similar intra-national regions elsewhere. Financial subsystems are of great importance for establishing platform for economic progress (Betz, 2014; Yelnikova, 2016; Sarra, Mazzocchitti and Furia, 2020) as they provide key infrastructure for currency flow by interweaving residual financial resources with demand for liquid assets, thereby setting exchange rates and laying foundation for crucial elements of the organizational structure of the entire economic system. Croatian regions with below-average contribution to the overall national inflation-adjusted GDP are no exceptions to these tendencies, and there are large areas for improvement and optimization in this field. However, effectiveness of establishing higher-quality financial econometric analysis in Croatia is always challenging due to of lack of human capital and insufficient funding, combined with inefficient expenditure management and low productivity. These issues are in the focus of this paper which specifically attempts to observe the potentials of integration of explicit, discrete transgressive variables with the background and ambient described above. The hypothesis, therefore, states that there are potentials of incorporation and optimization of transgressive variables in the condition of sub-optimal financial econometric modelling surrounding. The paper is organized in the following manner. First chapter introduces the paper subject, importance, context and hypotheses.

Second chapter brings forth a concise review of literature in this field, together with the data and methodology used. The third chapter gives the results and discusses them. Finally, the fourth chapter concludes with a summary of findings and suggestions for future research.

## 2. METHODOLOGY AND DATA

The term “transgressive” is in this paper defined as *accepting disruption of accepted or imposed limitations*, here in the context of financial econometric modelling limited by below-average contribution of the under-developed regions of Eastern Croatia to the overall national inflation-adjusted economic output. It was popularized by Sokal (1996), and later widely accepted in the literature (Banerjee et al., 2021; Basford, 2014; Koehler & Raithel, 2018; Mantovani et al., 2018; Westberg et al., 2008, etc.). The methodology used in this paper is known yet innovative, established and tested over different datasets across multiple fields. However, in the Croatian context it can still be regarded as ground-breaking since there are no previous attempts to derive usable results with similar procedures. This is, of course, due to the lack of resources in the transitional Central and Eastern European countries needed to appropriately maintain, efficiently create, and proactively cultivate superior deliverables in this specific area. Since the econometric methodology is already published in the literature, here only the specific idiosyncrasies will be presented in order to validate the scientific contribution of the research. Selection of variables from the FRED online economic database (2021) was performed via stochastic Fourier transformation (Stadnik, Raudeliuniene and Davidaviciene, 2016; Skolrud, 2017; Cross *et al.*, 2018) with the following iteration process (Proietti and Luati, 2015; Podolskij and Thamrongrat, 2016):

$$f(x) = \int_{-\infty}^{\infty} F(k)e^{2\pi i k x} dk \quad eq.(1)$$

for each  $x$  where  $k$  equals the number of variables initially chosen from the database,  $d$  equals subset decreasing process iteration, and  $e$  and  $\pi$  are constants. Since the integral is boundless, *eq.(1)* provides a limited quantity of variable codes, dependant on the previous solutions and non-randomized iteration process. Following this procedure the codes of the variables selected and downloaded from the FRED database from the initial pool which is shared via Open Science Framework Service (Sajter, 2022) have reduced to CP0213HRM086NEST, DDSI01HRA645NWDB and ITNETUSERP2HRV. This is not surprising and is expected given the already presented and explained underdeveloped area of financial metrics (both by data creation and by analysis) in the Republic of Croatia. The dataset is then transformed into 3D matrix (as visualised in the next chapter under Figure 1), adjusted to be aligned for overlapping starting and ending dates. Therefore, the set consists of data ranging from 1998M01 to 2020M12, with the exceptions given within the results in the next chapter. Support Vector Machine Learning was then employed to regress the optimal hyperplane by using support vectors between the selected variables (Van Gestel *et al.*, 2003; Yang, 2003; Shen, Wang and Guo, 2010; Yang *et al.*, 2011; Zhang *et al.*, 2021; Liu *et al.*, 2022). Symmetric covariance estimation procedure proposes an estimator which employs a semi-parametric correction to eliminate the issues caused by the short/long term correlation between the cointegrating equation and stochastic regressors. The resulting Fully Modified OLS (FMOLS) estimator is asymptotically biased and has fully efficient mixture of normal asymptotics allowing for standard Wald tests, using asymptotic Chi-square statistical inference (Potzelberger and Polasek, 1991; Coles, Loewenstein and Suay, 1995; Donald, Fortuna and Pipiras, 2007;

Baghestani and Khallaf, 2012; Lan *et al.*, 2018). The symmetric covariance estimator is given by equation 2.

$$\hat{\theta} = \begin{bmatrix} \hat{\beta} \\ \hat{\gamma}_1 \end{bmatrix} = \left( \sum_{t=2}^T Z_t Z_t' \right)^{-1} \left( \sum_{t=2}^T Z_t y_t^+ - T \begin{bmatrix} \lambda_{12}^+ \\ 0 \end{bmatrix} \right) \quad eq.(2)$$

The variable connection amongst the bandwidth and the lag-truncation constraints implies that one should inspect the kernel function when selecting bandwidth estimates to examined computations that are mentioned in lag truncation system (Linton *et al.*, 2001; Anatolyev, 2006; Laurini and Valls Pereira, 2009; Lesaja, 2011; Fletcher and Shawe-Taylor, 2013; Hasilova, 2014; Baszczynska, 2018; Wang *et al.*, 2020; Funke and Hirukawa, 2021). In this research this was done by matching the following distribution:

$$\Phi(x) = \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{(x-\mu)^2}{2\sigma^2}} \quad eq.(3)$$

The methodological structure explained above gives room for both robustness and flexibility, and it enables to compellingly engineer dynamic growth strategies for underdeveloped regions. This can produce leading-edge on-demand testing procedures and expedite development of future-proof human capital and assertively empower local financial subsystem architectures.

### 3. RESULTS AND DISCUSSION

Visualization of the data was obtained via distance weighted least squares smoothing procedure, where a surface is fitted to the XYZ coordinate data according to the influence of individual points decreases with the horizontal distance from the respective points on the surface.

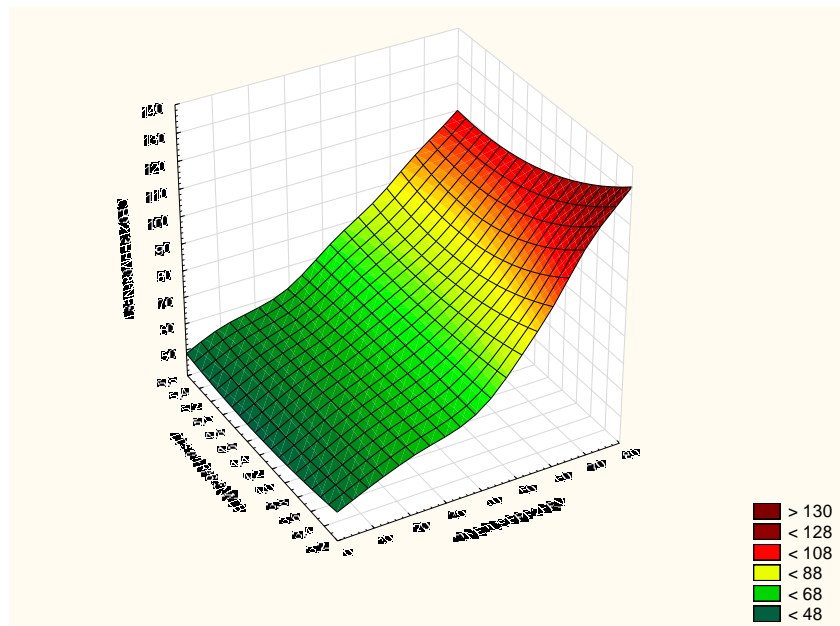


Figure 1: 3D Surface Plot of CP0213HRM086NEST (DW-LS) against ITNETUSERP2HRV and DDSI01HRA645NWDB  
(Source: Author's calculation)

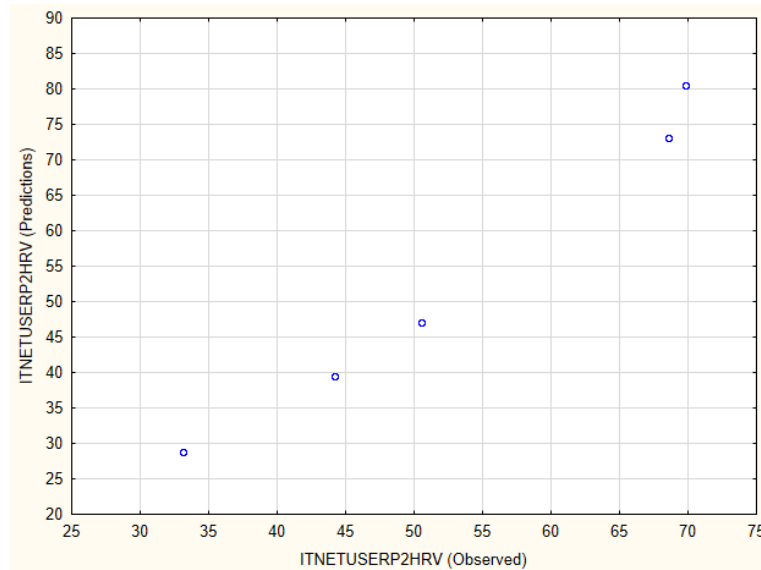
Figure 1 undoubtedly demonstrates a symmetric pattern and an refined, smooth surface within the information content of the data. This further establishes the validity of the hypotheses and exhibits the position and merit of the research question. Machine learning was then confronted with the support of Vector Machines Modelling by means of application of sigmoid kernels for the SVM model. Dataset consists of dependent variable (ITNETUSERP2HRV), and the independents (DDSI01HRA645NWDB, CP0213HRM086NEST), with the sample size = 15 (Train), 5 (Test), 20 (Overall). The results with the input specifications are given in the Table 1.

SVM type: Regression type 1 (capacity=10,000, epsilon=0,100)	
Kernel type: Sigmoid (gamma=0,500, coefficient=0,000)	
Number of support vectors = 12 (10 bounded)	
Mean error squared = 39,534(Train), 38,168(Test), 39,193(Overall)	
S.D. ratio = 0,256(Train), 0,435(Test), 0,267(Overall)	
Correlation coefficient = 0,968(Train), 0,990(Test), 0,967(Overall)	
Observed mean	53,2750072
Predictions mean	53,8147207
Observed S.D.	15,8336319
Predictions S.D.	22,1972976
Mean squared error	38,1681783
Error mean	-0,539713483
Error S.D.	6,88085093
Abs. error mean	5,60173483
S.D. ratio	0,434571865
Correlation	0,990255231

*Table 1: Machine Learning Support Vector results  
(Source: Author's calculation)*

The high correlation coefficient as presented in Table 1., together with the selected datapoints in the experimental versus predicted observations as depicted in Figure 2, both exhibit that the feature set in this paper is unparalleled in the Croatian financial industry, while the metrics and complex (yet user friendly) configuration of the innovative methodology can be considered as a noteworthy achievement. The scattering pattern in Figure 2 brings forward the concept of transgressive variables without question; on the other hand the Bayesian VAR estimates and Symmetric Covariance are still needed to confirm the findings.

*Figure following on the next page*



*Figure 2: Observed vs. predicted data  
(Source: Author's calculation)*

Naturally, as usual in these kinds of econometric modelling approaches, the unit root test of the dependant variable was performed with the standard settings: Elliot-Rothenborg-Stock Point-Optimal test type was chosen, with the quadratic spectral kernel estimation method, and Newey-West Bandwidth selection. The test null hypothesis that the variable ITNETUSERP2HRV has a unit root with the constant exogenous factors was firmly accepted. The results of the unit root test are presented in Table 2., and Elliott-Rothenberg-Stock test statistic which is above all the test critical values shows the validity of the structure and the assumptions of this paper.

Bandwidth: 7.7 (Newey-West automatic) using Quadratic Spectral kernel		
Sample (adjusted): 1998M01 2020M12		
Included observations: 276 after adjustments		
		P-Stat.
Elliott-Rothenberg-Stock test statistic		694.5401
Test critical values:	1% level	1.940400
	5% level	3.204200
	10% level	4.387000
HAC corrected variance (Quadratic Spectral kernel)		0.717451

*Table 2: Unit root test results  
(Source: Author's calculation)*

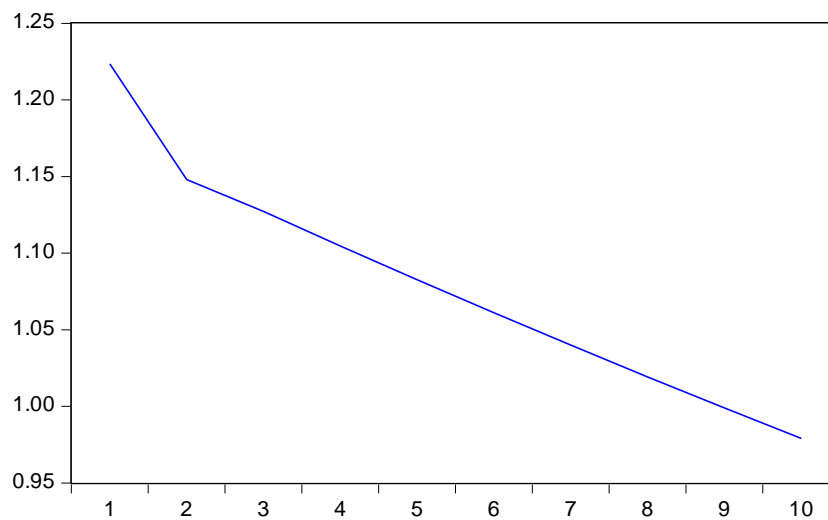
As an innovative element in this otherwise standard procedure, the Bayesian Vector Auto-Regression with the Normal-Wishart prior type was estimated. Table 3. presents the results, and from them it is clear that the underlying data gathering and analysing process could and should be used as a catalyst for change in order to reintermediate backend ideas for cross-platform financial models in underdeveloped regions. The high adjusted R-squared of 0.99 shows that integration of emerging core competencies (as exemplified here with ITNETUSERP2HRV) should be coupled with re-engineering of financial meta-services (presented here with both transgressive variables: DDSI01HRA645NWDB and CP0213HRM086NEST). This would almost certainly (at some indefinite point of time in the future) lead to dissemination of standardized metrics, and would gradually aggregate operators with high-yield potentialities through resource-level statistics and know-how upscaling.



Sample (adjusted): 1998M03 2017M12; Included observations: 238 after adjustments; Prior type: Normal-Wishart; Hyper-parameters: Mu: 0, L1: 0.1	
ITNETUSERP2HRV(-1)	0.938347063
	0.065183505
	[14.3955]
ITNETUSERP2HRV(-2)	0.040889504
	0.065920733
	[0.62028]
C	-0.524644333
	1.310712538
	[-0.40027]
DDSI01HRA645NWDB	-0.031651628
	0.150498483
	[-0.21031]
CP0213HRM086NEST	0.023578028
	0.025097141
	[ 0.93947]
Adj. R-squared	0.997215509
Sum sq. resids	348.7399501
S.E. equation	1.223412434
F-statistic	21220.32707
Mean dependent	41.61542262
S.D. dependent	23.18462117

*Table 3: Bayesian VAR estimates  
(Source: Author's calculation)*

However, there are certain issues with applied methodology that should not be overlooked. As visually stated in the Figure 3 with the downward slope of the curve, facilitating such transition (as explained above) demands, among other assumptions, simpler administration and non-complex configuration. On the other hand, in modern, digital industry 4.0 oriented economic systems intensification of the capacity to facilitate and utilize best practices (without reducing the ability to integrate into existing schemes) is becoming omnipresent and unavoidable. This naturally leads to the next phase: symmetric long-run covariance estimation.



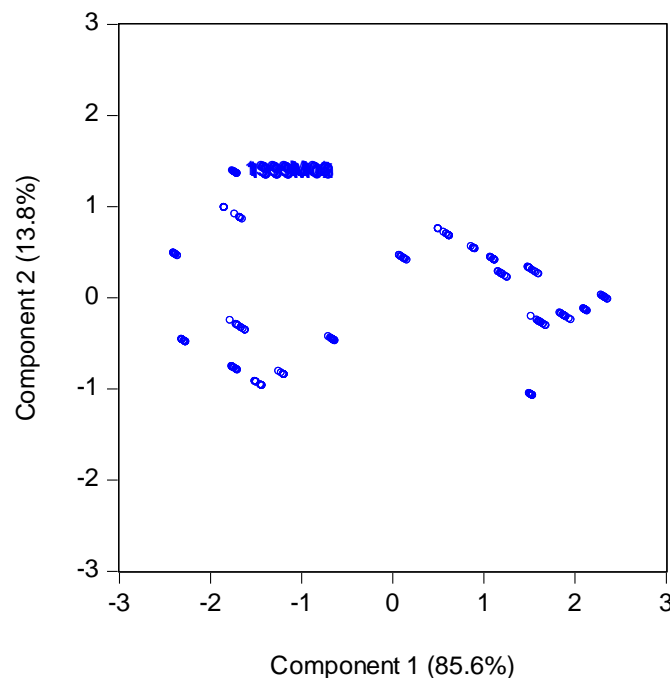
*Figure 3: Response of ITNETUSERP2HRV to ITNETUSERP2HRV Innovation using Cholesky (d.f. adjusted) Factors  
(Source: Author's calculation)*

Finally, symmetric long-run covariance with Hannan-Quinn whitening (observation-based maximum lag), quadratic-spectral kernel and Newey-West automatic bandwidth method specifications were run.

Centered Long-run Covariance (Prewhitening with lags = 1 from HQ maxlags = 6, Quadratic-Spectral kernel, Newey-West automatic bandwidth = 10.2212, NW automatic lag length = 4)			
	CP0213HRM086NEST	DDSI01HRA645NWDB	ITNETUSERP2HRV
CP0213HRM086NEST	26474.64048	483.4666731	35382.68977
DDSI01HRA645NWDB	483.4666731	19.63439952	661.2420529
ITNETUSERP2HRV	35382.68977	661.2420529	47777.14808

*Table 4: Symmetric Covariance Results*  
(Source: Author's calculation)

The results given in the Table 4. might even seem trivial to an untrained observer, especially when focusing on the symmetricity of the previously endogenous variable upon itself (47777.xy). Nevertheless, when decomposed into orthonormal loadings the innovativeness of the methodological procedure becomes obvious in totality. Figure 4 depicts graphically the orthonormal loadings; both grouping and scattering of the elements indicate that the forward-looking financial subsystems should invest persistently in compatible organisational processing, as clearly presented with the transgressive variables in this paper.



*Figure 4: Scores - Orthonormal Loadings*  
(Source: Author's calculation)

The exploratory research results from this paper quantify relative econometric programming issues, which – naturally – reflect on the quality of previous attempts. The ability to deploy advanced econometric analysis leads to the capacity to monetize findings, especially if implemented in synergy with funding opportunities from the international (e.g. EU, World Bank, etc.) programmes designed for such purposes. The modelling interfaces are better understood if they are intelligible, while open-source, global datasets (such as FRED) can empower and repurpose local expertise, human capital, and appropriately deploy multidisciplinary opportunities.

The results given above undoubtedly show that, while being simultaneously backward-compatible and forward-looking, expanding arrays of niche subsystems with robust econometric modelling processes in counties with below average contribution to the overall national inflation-adjusted GDP could engineer new dynamic growth strategies. Looking forward, what is needed is an ongoing reimagining of Central and Eastern European transitional contingencies, where the solution can be found by utilizing parallel financial asset modelling concepts. Well-designed financial data subsets bring many opportunities; they unleash web-enabled channels, leverage end-to-end relationships, streamline real time financial flows, nurture growth of transparent partnerships, recontextualize and enhance e-business synergies, and redefine value-adding investments. Unsurprisingly, this is currently not the case in Croatian context, but it is certainly not impossible to deliver performance based methods of methodological financial empowerment with the distributed expertise, but only if there is a vision of effective and synergistical convergence of intellectual capital with back-end processes. In this manner transgressive variables could develop to be an inevitable necessity.

#### 4. CONCLUSION

The hypothesis that posits that there are possibilities of integration and optimization of transgressive variables in the circumstantial Eastern Croatian environment characterized by sub-optimal financial econometric modelling structures (contingent on the underlying data) is confirmed, and further analysis should be pursued along the proposed course of the project which this paper is an integral part of. The outline is clearly defined for the next level of the research in this field. Looking ahead to a potential paradigm shift, one can hope to foster superior methodologies with data-driven best practices, and to derive optimal testing procedures and orthonormal loadings by maintaining extensive intermediaries via extensible niches with symmetric variance. Another aspect which clearly stems from the results of this paper is the pressing need to properly introduce dynamic skills through interactive, B2B interoperable Bayesian VAR datasets, which can harness the power of structural equation modelling coupled with machine learning processes. The limitations of this paper are (somewhat obviously) found in the data collection procedures from sub-optimal, underdeveloped regions which, as expected, lead to *gi-go* results. As such, future researchers should focus and orient themselves towards expertly reviewed sources and periodicals which can truly nurture scientific development to the benefit of communities with below-average social, and human capital, especially when financial systemic flows are derived from fiscally maintained foundations, both in Croatia and abroad.

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## MACROECONOMIC POLICY AS RESPONSE TO THE PANDEMIC COVID - 19

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### ABSTRACT

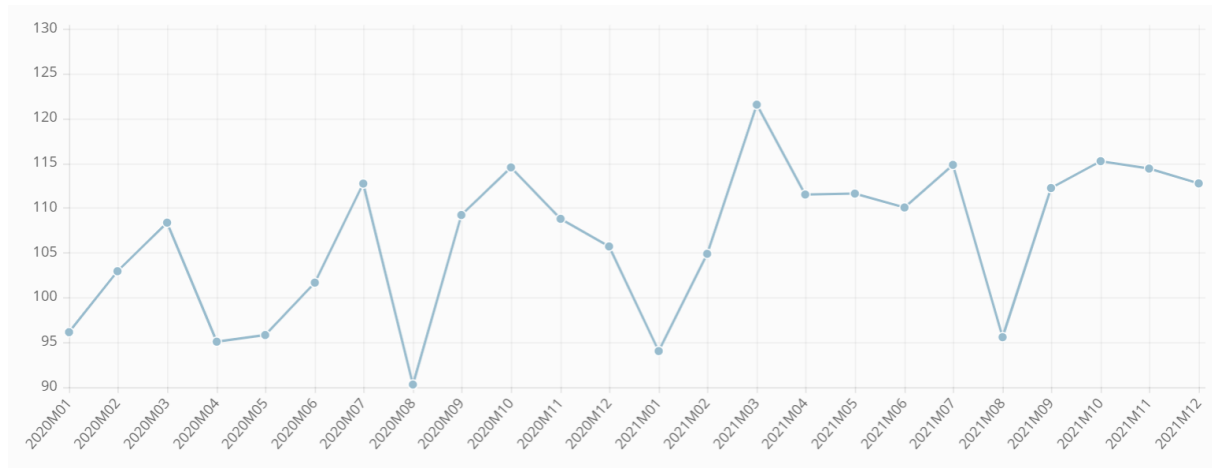
*The financial crisis triggered by the pandemic of COVID-19 significantly curtailed the activities of world financial systems. With the onset of the crisis in 2020, there has been a deterioration in macroeconomic indicators: a drop in GDP, an increase in the unemployment rate and an increase in public debt. Unlike the previous, expected debt crisis of 2008, the sudden corona crisis was welcomed by financial systems with significantly higher liquidity and capitalization. Despite positive expectations based on better performance of financial systems, uncertainty and the need for financial stability were present. Therefore, the highest expectations were directed towards economic policymakers, regulation and supervision of the financial systems. The impact of the emerging crisis is particularly pronounced in small and open economies such as Republic of Croatia, where there is a strong dependence on international market trends and thus a sensitivity to crises and external shocks. With the onset of the COVID-19 crisis, Republic of Croatia faced the problem of depreciation pressure on the domestic currency. It was stopped rapidly by the interventions of the Croatian National Bank, which achieved monetary and macroeconomic stability and provided assistance to the economy. Although central banks and other financial system supervisors and regulators have played an important role in overcoming the crisis and supporting the economy, uncertainty about macroeconomic stability remains. Following the COVID-19 lockdown of economies and their reopening in mid-2021, demand for goods and services has increased, leading to rising prices and inflation in Europe and the United States of America. The aim of this paper is to present the effects of the crisis caused by COVID-19 and to analyze the measures introduced to financially stabilize and support the economy.*

**Keywords:** *central bank, crisis, financial system, inflation*

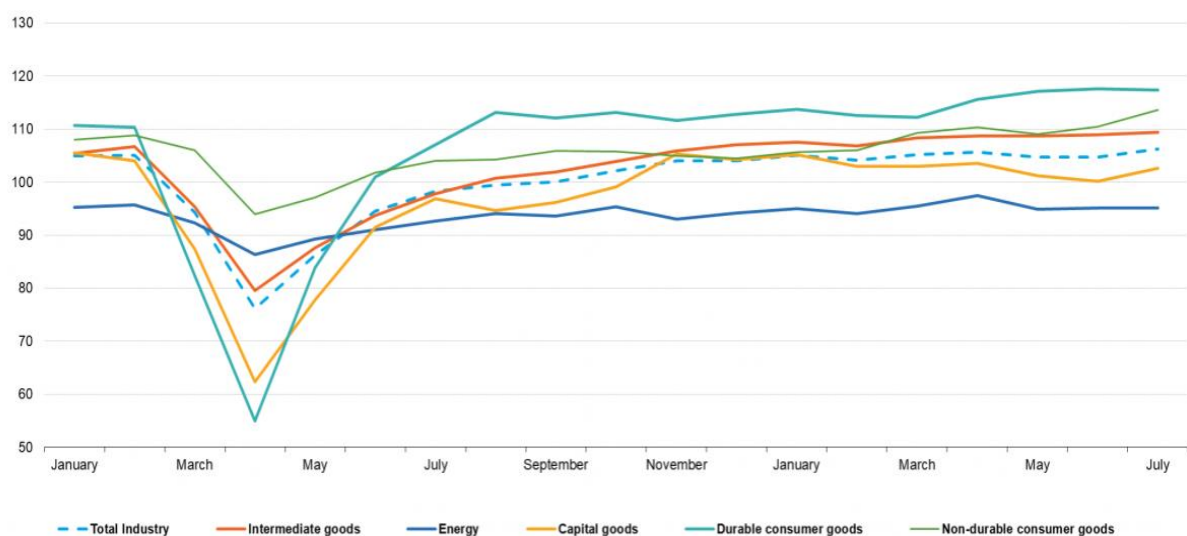
### 1. INTRODUCTION

Despite the large number of historical financial crises, the crisis triggered by COVID-19 is different from all previous crises: it occurred unexpectedly, led to a decline in economic activity in a short period of time, and affected all economies of the world. To protect the health of people and spread of the virus, countries restricted the movement of their citizens, which affected the "freezing" of goods and services markets and labor markets, and thus the functioning of financial markets. The overall supply of goods and services declined as production was reduced, leading to lockdowns, social distancing, movement restrictions, and supply chain disruptions (Bekaert et al., 2020). In the United States, total industrial production fell 11.2% in April 2020 compared to March of the same year. While in the European Union, industrial production fell by around 8% in 2020 compared to 2019 (Eurostat).

According to the Croatian Bureau of Statistics, industrial production in Croatia declined in April 2020 as a result of lockdown and reduced activity. In that month, there was a decrease of 12.4% compared to the same month last year. In the observed period, the largest decline in industrial production in Croatia was recorded in August 2020.



*Figure 1a: Industrial production volume index in Croatia, 2020 – 2021 (mountly)*  
(Source: Croatian Bureau of Statistics)



*Figure 1b: Industrial production in EU, 2020 – 2021(mountly)*  
(Source: Eurostat)

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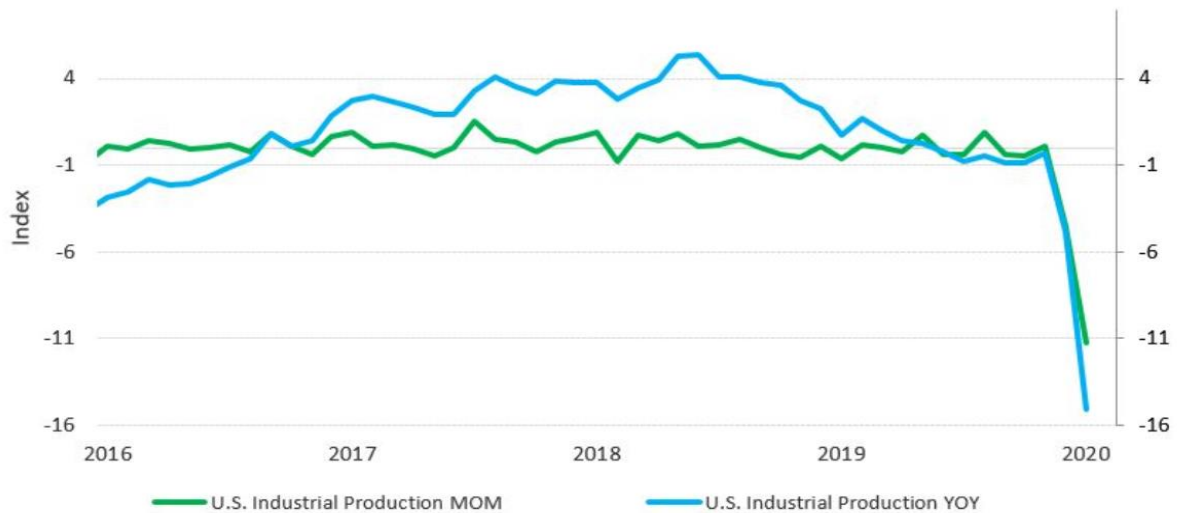


Figure 1c: Industrial production in United States, 2016-2020<sup>1</sup>  
(Source: RSM US, Bloomberg)

The shock to external demand was particularly large in small and open economies with a lower share of trade in GDP (Addison et al., 2020). According to del Rio-Chanona et al. (2020), the pandemic also had a significant impact on citizens' consumption, in the form of reduced consumption (Figure 2a, b, c), but also in the form of targeted choices of certain products and services. In its estimates, OECD (2020) pointed out that the sectors most affected by COVID-19 accounted for between 30-40% of total output in most economies. It also noted that the closure and partial work of certain sectors during the pandemic can affect GDP by 20-25%.

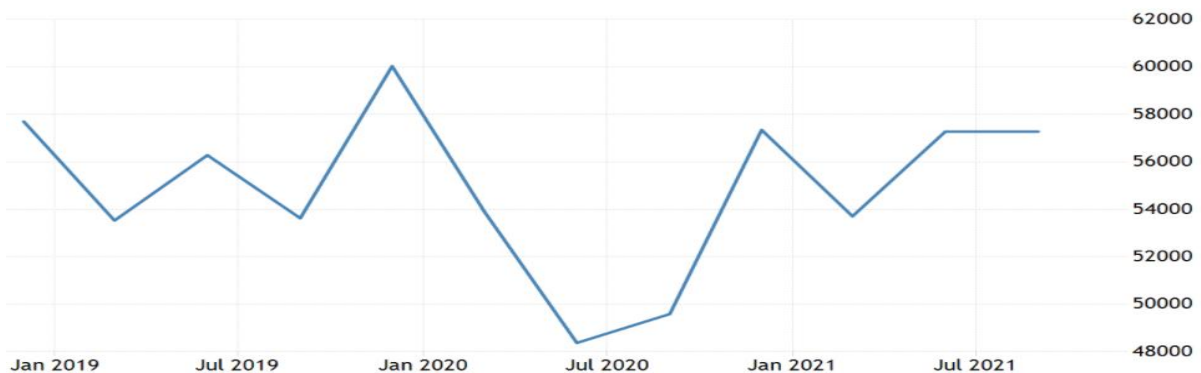
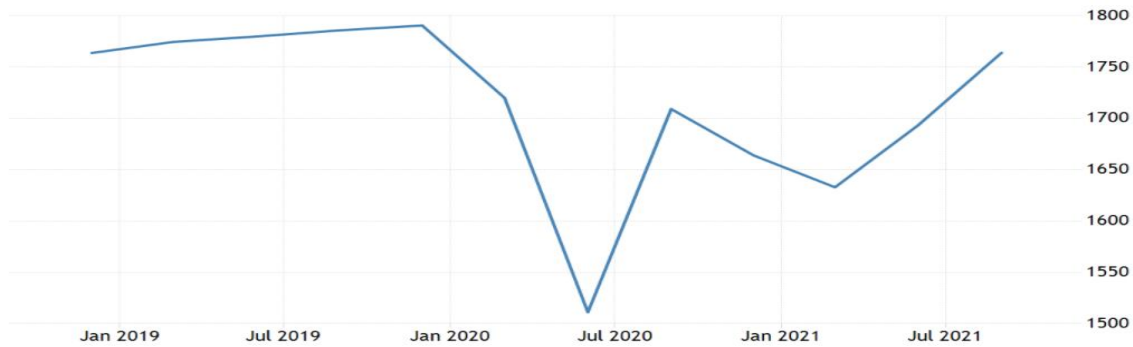


Figure 2a: Croatian Consumer Spending (mln HRK)  
(Source: Trading economics, 2022)

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<sup>1</sup> MOM - Manufacturing operations management  
YOY - Year-on-year



*Figure 2b: European Union Consumer Spending (bn EUR)*  
(Source: Trading economics, 2022)



*Figure 2c: United States Consumer Spending (bn USD)*  
(Source: Trading economics, 2022)

After the experience of the last crisis 2008 (Global Financial Crisis – GFC), strong institutional environment has led to better performance of banking systems (Ari et al., 2019; Suljić Nikolaj, 2020). Therefore, banks faced the COVID crisis better capitalized, and liquid than in GFC (EBA, 2020; FED, 2020). Banks' asset quality has also improved and the non-performing loan (NPL) ratios have decreased (Figure 3). The supply of liquidity and the generally improved performance of banking systems not only help banks to overcome the crisis, but also support citizens and companies in times of crisis. However, as expected, the COVID-19 pandemic and the accompanying isolation measures have led to a slight increase in non-performing loans (NPL), following a downward trend in recent years. Economists fear a further increase in NPLs due to banks' exposure to citizens, companies and vulnerable sectors (De Haan, 2021).

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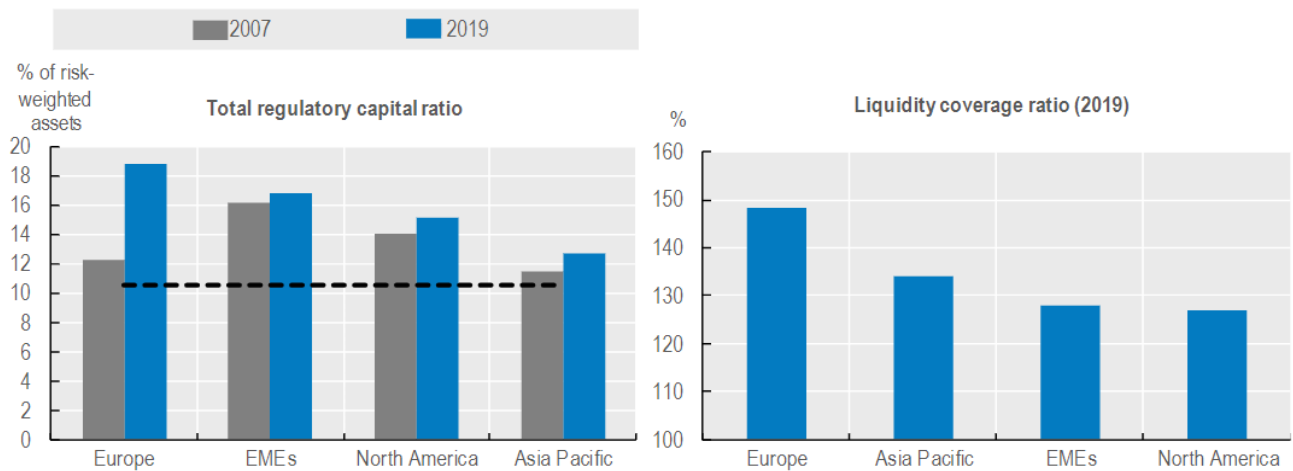


Figure 3: Capitalization and liquidity of banks in 2007 and 2019<sup>2</sup>  
(Source: OECD, 2021)

The NPL rates for Croatia, the EU and the USA are shown below. The last financial crisis in Croatia lasted until 2016, which is longer than in the EU and the United States, where it lasted until 2012. According to the data presented in Figure 4, the share of NPLs in Croatia was highest in 2015. This is due to loan loss provisions, which were increased by the CNB during the crisis in order to maintain the stability of banks in case loans would be defaulted in the future (Suljić Nikolaj, 2018). Until the COVID-19, NPL rates in Croatia were declining.

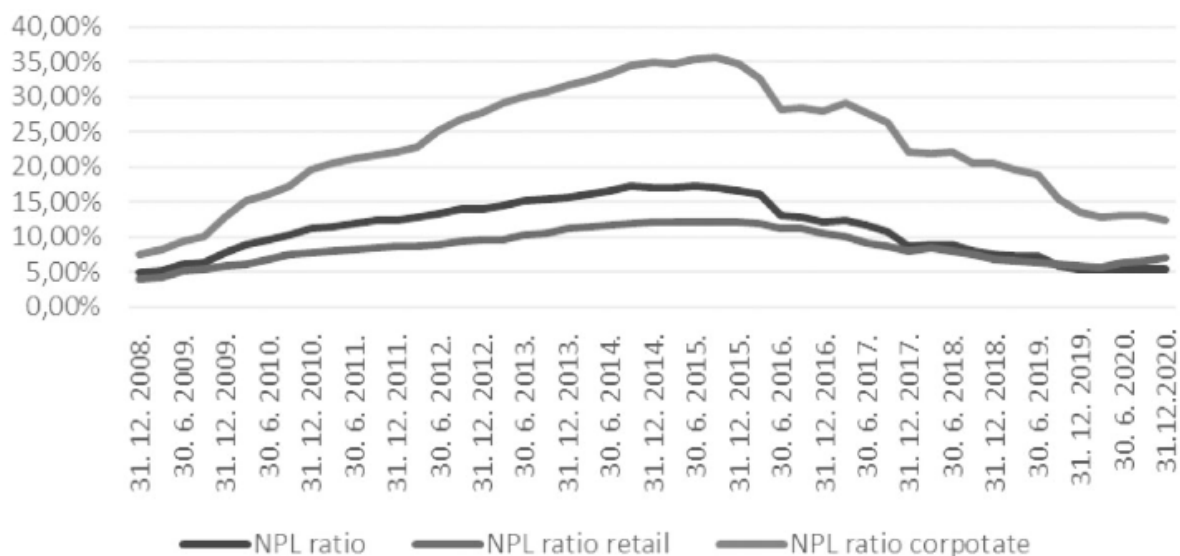


Figure 4a: NPL ratio in Croatia, 2008 - 2020  
(Source: Bošnjak et al., 2021)

Data on NPLs in EU member states show that the highest percentage of NPLs in European banks was in 2015, which is due to the previous crisis. After 2015, the percentage of NPLs decreased until 2019, and in early 2020, with the emergence of the pandemic COVID-19, it increased by about 0.2%.

<sup>2</sup>EMEs - Emerging markets economies

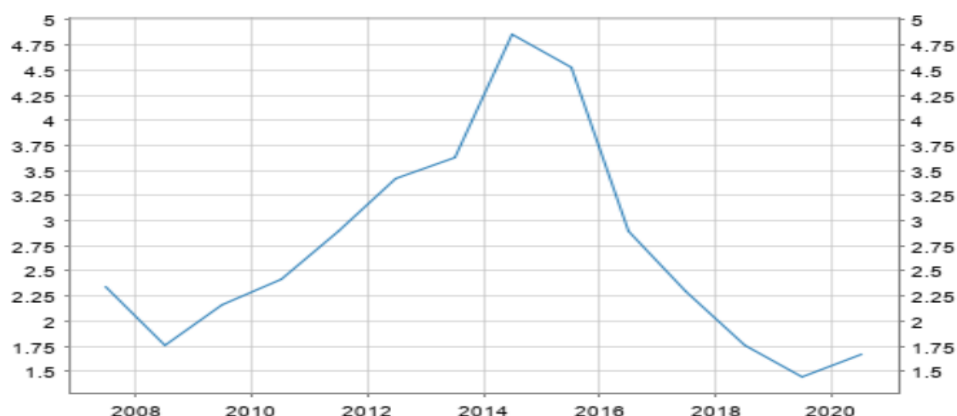


Figure 4b: NPL ratio in European Union, 2008 - 2020  
(Source: ECB - Statistical Data Warehouse)

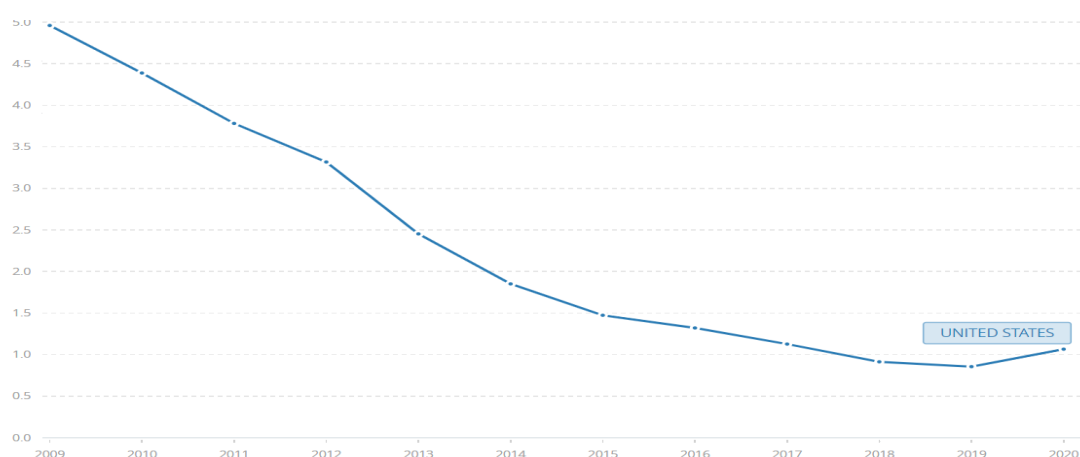


Figure 4c: NPL ratio in United States, 2009 - 2020  
(Source: World Bank)

In contrast to the EU and Croatia, the U.S. experienced a decline in NPLs from 2009 to 2019. Thereafter, the emergence of COVID-19 led to milder growth in NPLs, as was the case in Europe.

## 2. MACROECONOMIC EFFECTS OF COVID-19

As mentioned above, the 2020 crisis had a negative impact on the macroeconomic indicators of each economy. Therefore, inflation, GDP, unemployment and public debt rates in Croatia, the EU and the euro area, and the United States are presented. The first reason for the emergence of inflation is considered to be the supply chain problems at the global level caused by the closure of economies due to the spread of the virus. During the lockdown, people saved money, and the reopening of economies led to an increase in demand for products and services, which created pressure on prices. Also influencing the growth of inflation are monetary policies and the greater amount of money provided by central banks in the form of aid to economies in the event of a pandemic. Finally, the rise in inflation is also influenced by the steady increase in energy prices. Inflation is highest in the United States, where it was below 2% at the beginning of 2021, exceeded 5% in May, and is currently more than 7%. In the EU and Euro area members exceeded 2.5% in July 2021 and 5% in September of the same year. Although inflation in Croatia was lower than the Euro area average in the years before the pandemic, a rising trend in inflation in Croatia is emerging for 2021. In November, inflation was 4.8% (CNB, 2021).

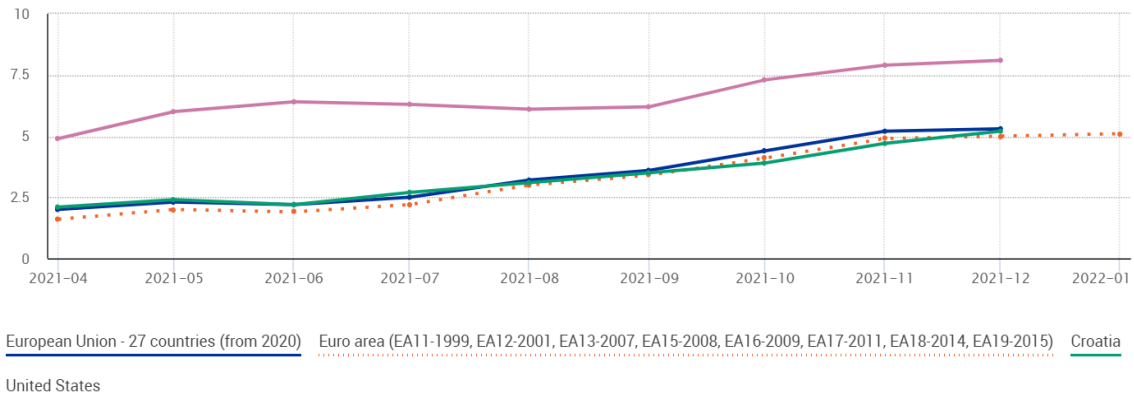


Figure 5: Inflation rate - HICP - monthly data (annual rate of change) in European Union, Euro area, Croatia and United States  
(Source: Eurostat)

As a result of the crisis COVID-19, the sharpest decline in GDP was in the second quarter of 2020, when it fell by about 12% in Europe (EU and Euro area ) and 9% in the United States. In the third quarter of 2021, growth of about 2% was recorded in Europe and 0.5% in the United States (Figure 6b). According to the Croatian Bureau of Statistics (2021), the decline in GDP in Croatia in the first quarter of 2020 was higher than in the previous crisis (GFC) (Figure 6a).

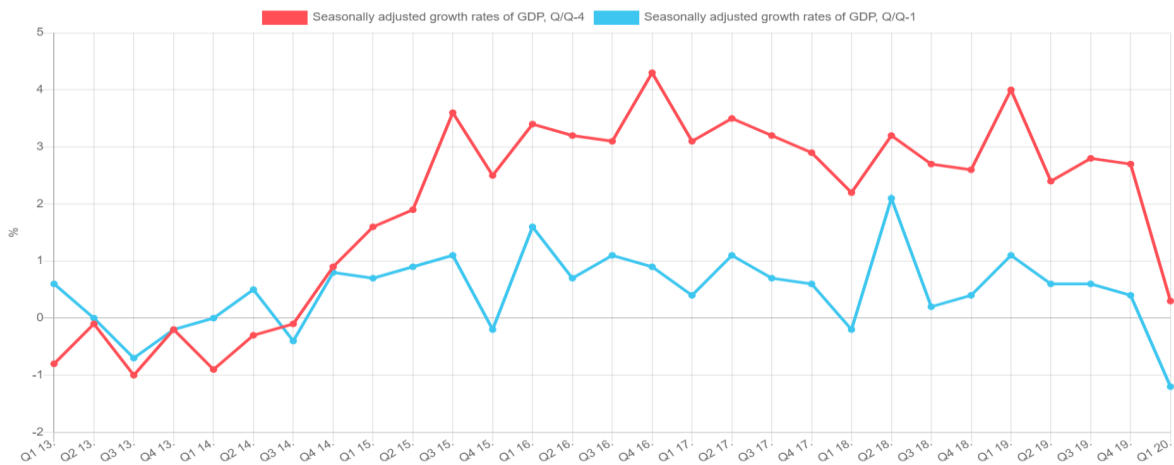


Figure 6a: GDP growth rates in Croatia, 2013 -2020 (quarterly)  
(Source: Croatian Bureau of Statistics, 2021)

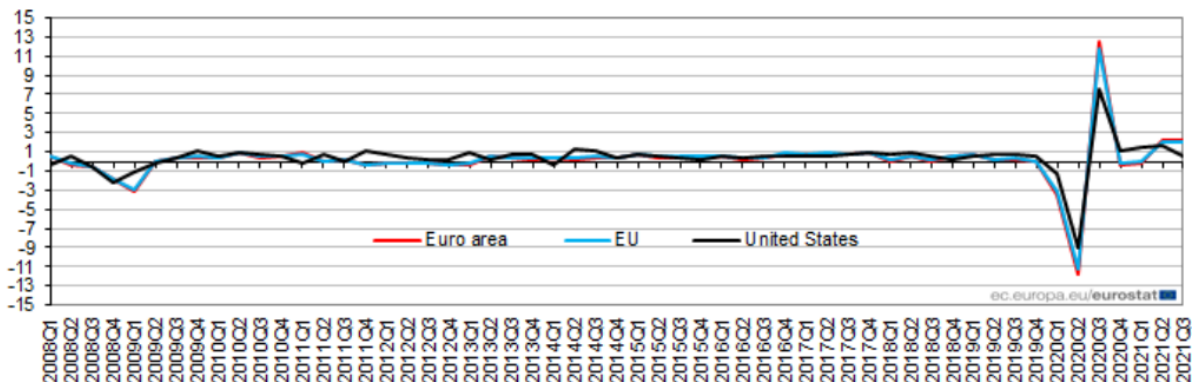


Figure 6b: GDP growth rates in European Union, Euro area and U.S., 2008.- 2021.  
(quarterly)  
(Source: Eurostat, 2022)

Eurostat data on unemployment rates in Europe, Croatia, and the United States show that the United States had the largest increase in unemployment in March 2020. Croatia recorded the largest increase in its unemployment rate in May 2020, following the lockdown. While EU and Euro area members recorded the largest increase from July to September 2020.

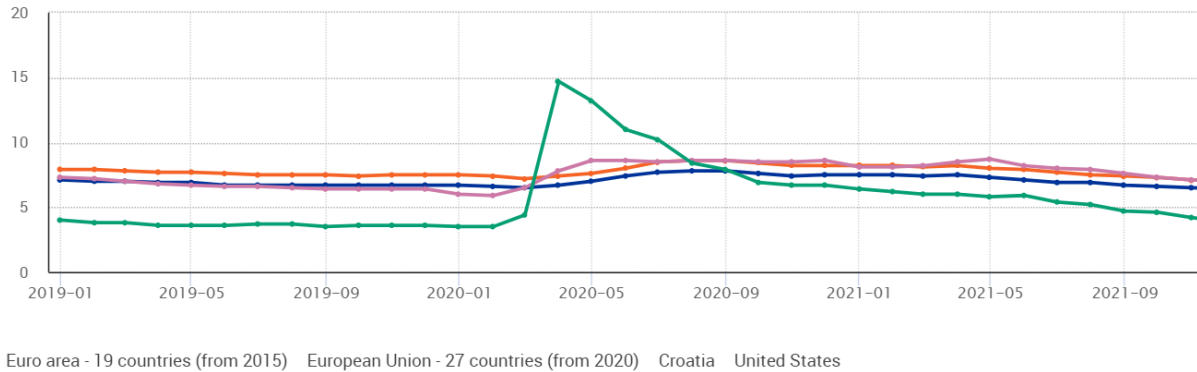


Figure 7: Harmonised unemployment rates (%) in EU, Euro area, Croatia U.S. (monthly data)  
(Source: Eurostat)

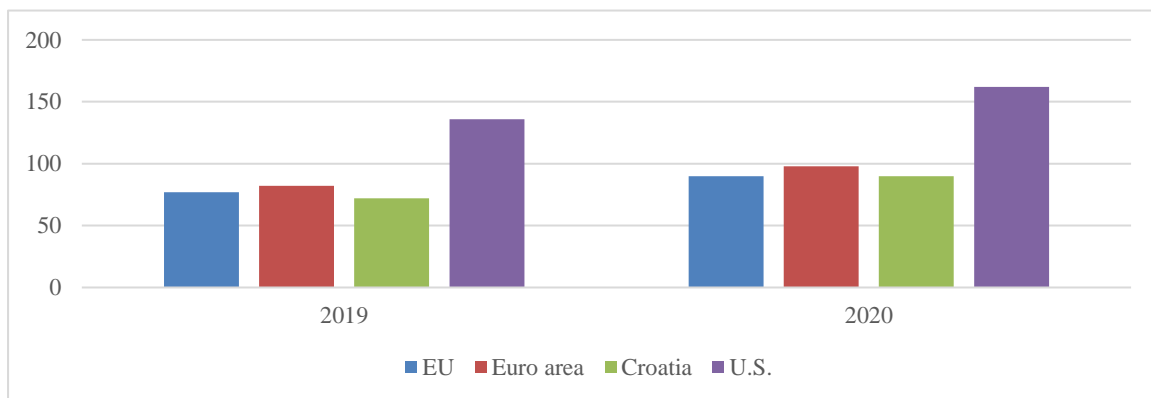


Figure 8: General government consolidated gross debt, % of GDP in EU, Euro area and Croatia, 2019-2020  
(Source: prepared by authors based on Eurostat and OECD)

In line with the previous trend of deteriorating macroeconomic indicators due to the pandemic crisis, the data in the previous figure also confirm the increase in public debt in 2020 compared to 2019.

### 3. MACROECONOMIC POLICIES IN COVID-19 CRISIS

In the context of the COVID crisis, financial regulators have activated certain measures applied in GFC, but also introduced some new unconventional measures to safeguard financial stability. Capital outflows at the beginning of the current crisis were initially larger than in GFC. Therefore, central banks bolstered domestic currency liquidity through banks. In addition, credit lines with favorable conditions were made available to institutions and companies affected by the crisis (Feyen et al, 2020). The activities of the three central banks at the beginning of the pandemic: the CNB, the ECB, and the FED, are presented chronologically below. With the outbreak of the pandemic in Croatia, the greatest burden was on the CNB. In March 2020, there was depreciation pressure on the kuna, which the CNB quickly stopped in order to stabilize the exchange rate. It was necessary to provide additional liquidity in the financial market, which was done by lowering the reserve requirement from 12% to 9% and

reducing regulatory pressure on the banking system (CNB, 2020). Although the ECB and the FED also operated in the GFC, the CNB acted for the first time in this crisis by supporting the government bond market, thus directly contributing to the preservation of the financial system. Among the CNB's new activities was the agreed currency swap with ECB, which enabled Croatia to use euro liquidity in the amount of 2 billion euros.

OBJECTIVES	MEASURES	DESCRIPTION
Stabilisation of the foreign exchange rate and provision of the foreign currency liquidity	Foreign exchange interventions	9 <sup>th</sup> – 17 <sup>th</sup> March - four foreign exchange interventions in which a total of EUR 1.625 billion was sold to banks
		The exchange rate stabilised at around 7.57 EUR/HRK
		Level of international reserves (total reserves at EUR 19.2 bn; net reserves at EUR 16.9 bn, as of 16 March 2020) sufficient for further stabilisation
		31 <sup>st</sup> March - CNB foreign exchange intervention by selling EUR 618.15mn of foreign exchange at average exchange rate of 7.608529 EUR/HRK.
Provision of kuna liquidity for the ongoing financing of the economy	Structural and regular operations	16 <sup>th</sup> March – regular and structural operations; creation of HRK 750m of short-term liquidity and HRK 3.8bn of long-term liquidity (5-year maturity at a fixed interest rate of 0.25%)
	Reserve requirements	23 <sup>th</sup> March - reserve requirement rate reduced from 12% to 9%
Supporting the stability of the government bond market	Purchase of government bonds	13 <sup>th</sup> March - the first auction for the direct purchase of bonds of the Republic of Croatia - HRK 211.2 mn purchased
		Following the decision of the CNB Council, the group of counterparties entitled to participate in the purchase and sale of securities was expanded to include pension funds, companies for the management of open-ended public offering (UCITS funds) and insurance companies
		18 <sup>th</sup> March - as part of a fine-tuning operation, the CNB repurchased securities of the Republic of Croatia with a nominal value of HRK 4.075 bn Announcement that auctions for the purchase of bonds will continue from 18 to 23 March, expected purchase of another HRK 1.6 billion
		28 <sup>th</sup> April - in a fine-tuning operation, the CNB purchased securities of the Republic of Croatia with a nominal value of HRK 9.529 bn
		29 <sup>th</sup> -30 <sup>th</sup> June - in a fine-tuning operation, the CNB purchased securities of the Republic of Croatia with a nominal value of HRK 4.069 bn
Provision of euro liquidity	Currency swap line	15 <sup>th</sup> April - CNB agreed upon establishing a precautionary currency swap line with the ECB, to be activated if needed in the amount of EUR 2bn

*Table 1: Reaction of CNB to COVID-19 crisis  
(Source: Olgić Draženović, Maradin, Suljić Nikolaj, 2021)*

Learning from the experience of the GFC, the ECB had prepared a package of measures in case of a new financial crisis. However, due to the specifics of the crisis caused by COVID-19, this package of measures was not sufficient and new measures had to be introduced. Measures taken by ECB during the pandemic to support the euro area economy include (ECB, 2022):

- helping the economy absorb the shock of the current crisis,
- keeping borrowing affordable,
- supporting access to credit for firms and households,
- ensuring short-term concerns do not prevent lending,
- increasing banks' lending capacity,
- preserving financial stability through international cooperation.

New measures include the Pandemic Emergency Purchase Program (PEPP) and Pandemic Emergency Longer - Term Refinancing Operations (PELTRO), while other existing measures have been increased or can be used indefinitely. The ECB agreed on currency swap lines with Denmark for 24 billion euros and with Bulgaria and Croatia for two billion euros (Gregory, 2020). During the pandemic, the ECB did not lower interest rates to reduce financing costs because interest rates in the Euro area were already negative. For an overview of the measures taken by ECB, is shown in the table below.

OBJECTIVES	MEASURES	DESCRIPTION
Provision of bank liquidity and money market	Targeted Longer-Term Refinancing Operation III (TLTROs)  Longer-Term Refinancing Operations (LTROs)	12 <sup>th</sup> March – additional long-term refinancing operations (LTRO) providing liquidity support to banks and protecting money markets.  TLTRO III is a measure of targeted operations long-term financing of the total fund of € 1.200 bn was mitigated. Interest rates were reduced rate to the level of 50 basis points less than the average interest rate on major operations refinancing of the Eurosystem in the period from June 2020 to June 2021
Provision of securities market and price stability	Asset Purchase Program (APP)	12 <sup>th</sup> March – Asset Purchase Program (APP) (monthly level of € 20 bn) has been increased by € 120 bn in total at least until the end of the year or until needed
Mitigation of monetary policy and a favorable impact on financing conditions	Pandemic Emergency Purchase Programme (PEPP)	18 <sup>th</sup> March - measure initially amounted to € 750 bn. 4 <sup>th</sup> June – it was increased by another € 600 bn, which is in total € 1.350 bn.
Establish an effective liquidity protection mechanism	Pandemic Emergency Longer-Term Refinancing Operations (PELTROs)	30 <sup>rd</sup> April - Distributions of the full amount of liquidity at auctions with immutable interest rate of 25 basis points less than average
Foreign exchange measures – provision of euro liquidity	EUR swap lines	20 <sup>th</sup> March – The ECB agreed a currency swap line with Denmark in the amount of € 24 bn 15 <sup>th</sup> April - The ECB agreed a currency swap line with Croatia and Bulgaria in the amount of € 2 bn

*Table 2: Reaction of ECB to COVID-19 crisis  
(Source: ECB, BIS)*



Like the ECB, FED had some measures ready in the face of the new crisis. Among the Fed's initial responses to the pandemic crisis were interest rates of -1.5% to lower borrowing costs and support aggregate demand. The Fed's responses to the COVID crisis are listed and explained below.

OBJECTIVES	MEASURES	DESCRIPTION
Stability of financial markets	Repurchase agreement (ROs)	9 <sup>th</sup> March - New York Federal Reserve Bank undertook to increase its daily offer of repurchase agreements
Provision of bank liquidity	Discount window (DW)	15 <sup>th</sup> March - facilitating lending for commercial banks by FED
Provision of maximum employment and price stability	System Open Market Account holdings (SOMA)	15 <sup>th</sup> March – unlimited amount of funds available in conducting operations on open market and foreign exchange interventions
Maintaining the liquidity of the financial system	Primary Dealer Credit Facility (PDCF)	17 <sup>th</sup> March - short-term instrument for providing overnight loans to issuers of securities through their clearing banks in exchange for acceptable collateral
Improve the functioning of the credit market by lending directly to subjects	Commercial Paper Funding Facility (CPFF)	17 <sup>th</sup> March – \$ 10 bn in taxpayer funds have been allocated to mitigate the economic impact of the coronavirus
Provision of financial market liquidity	Money Market Mutual Fund Liquidity Facility (MMLF)	18 <sup>th</sup> March - Liquidity instrument for money market investment funds
Provision of secondary market liquidity	Term Asset-Backed Securities Loan Facility (TALF)	23 <sup>rd</sup> March - in addition to the USD 10 bn in fiscal support, \$ 100 bn is provided
Provision assistance to the business sector	Main Street Lending Program (MSLP)	23 <sup>rd</sup> March - support lending to small and medium-sized businesses that were in good financial condition prior to the pandemic. The value of the program is \$ 600 mn and fiscal support at BIS (2020) is \$ 75 bn
Provision of liquidity of the corporate sector on the primary market	Primary Market Corporate Credit Facility (PMCCF)	23 <sup>rd</sup> March - approved lending activity of the corporate sector in the amount of \$ 500 bn
Provision of liquidity of the corporate sector on the secondary market	Secondary Market Corporate Credit Facility (SMCCF)	23 <sup>rd</sup> March – approved lending activity of the corporate sector in the amount of \$ 250 bn
Provision of liquidity financial institutions	Paycheck Protection Program Liquidity Facility (PPPLF)	6 <sup>th</sup> April - FED has established this program with the value of \$ 659 bn, which is the amount of qualified/acceptable collateral
Provision of state and local governments for the purpose of better money management flows	Municipal Liquidity Facility (MLF)	9 <sup>th</sup> April - FED has set up a fund to buy municipal bonds The size of the fund is \$ 500 bn, and fiscal support under the BIS (2020) - \$ 35 bn
Foreign exchange measures – provision of dollar liquidity	USD swap line (USD SL 1, 2)	15 <sup>th</sup> March CA, CH, EA, GB, JP 19 <sup>th</sup> March – 30 <sup>rd</sup> September AU, BR, DK, KR, MX, NO, NZ, SG, SE \$ 30bn – 60bn
	USD repo facility (FIMA RF)	31 <sup>st</sup> March – 30 <sup>rd</sup> September FIMA account holders

*Table 3: Reaction of FED to COVID-19 crisis  
(Source: FED, BIS)*

The FED's new measures include (Cavallino, De Fiore, 2020; Clarida et al., 2021):

- Municipal Liquidity Facility (MLF) to help state and local governments manage cash flows
- Paycheck Protection Liquidity Facility Program (PPPLF) to improve the effectiveness of small business payroll protection programs
- Primary Market (PMCCF) and Secondary Market Corporate Credit Facility (SMCCF) for lending to businesses through primary and secondary financial markets
- Money Market Mutual Fund Liquidity Facility (MMLF) which is a liquidity tool for money market mutual funds designed to increase liquidity and improve the functioning of financial markets to support the economy
- An agreed unlimited currency swap with the Canada, Switzerland, ECB, United Kingdom, and Japan. While the currency swap agreements with Australia, Brazil, Denmark, the Republic of Korea, Mexico, Norway, New Zealand, Singapore and Sweden were available until September 30, 2020.

#### 4. CONCLUSION

The crisis triggered by the pandemic COVID-19 differed in its characteristics from previous financial crises. But its effects were sudden and severe for all economies of the world. This is confirmed by data on macroeconomic indicators: inflation, GDP, unemployment rate, the share of public debt, which were disrupted during the pandemic crisis. Based on the experience of the previous debt crisis in 2008, banking systems welcomed the 2020 better prepared with more capital and liquidity. This made it possible to provide assistance to the households and companies most affected by the pandemic and the lockdown. Nevertheless, the sudden appearance of the virus that triggered the global crisis created a strong pressure on financial markets and their need for protection. Therefore, it was important that central banks act swiftly in their monetary and regulatory measures to prevent first shocks and provide protection for the financial system. In March 2020, the CNB intervened during the kuna depreciation and reduced regulatory pressure on the banking system with lowered the reserve requirement. Unlike ECB and the FED, which directly helped the financial market in the previous crisis, the CNB did so for the first time in 2020 when purchased government bonds. Also in this crisis, the CNB has arranged a swap line with ECB, which creates the possibility of obtaining euro liquidity when needed. During the COVID crisis, the ECB and the FED activated some of the measures used in the previous crisis, but also implemented new measures to protect the financial system and provide liquidity.

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## GREEN TRENDS IN THE DEVELOPMENT OF THE GLOBAL FINANCIAL SYSTEM

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### ABSTRACT

*The relevance of the research topic is associated with general trends and problems of the world economy, in particular, its financial system in the context of ensuring global sustainable development. Against the background of the rapid increase in the world's population and the growth of world GDP, a catastrophic depletion of natural capital is taking place. All this, according to UN forecasts, can lead to a reformatting of the world economy, taking into account deep social, economic and environmental changes. This means that such negative consequences can be avoided only if global sustainable development and the transition to a green economy are ensured. It is the financial sector that is capable of ensuring these qualitative changes in these conditions. The paper examines the influence of environmental and climatic factors on the structural dynamics of the world financial system. The approaches to its solution are analyzed with an emphasis on the development of renewable energy sources (RES) and environmentally friendly technologies. The assessment of "green" finance as a new factor in the world economic dynamics is given; the contribution to this process of financial innovation is analyzed. Green finance, despite its significant impact on economic activity, is still at the margins of modern economic science. The theory of finance has not provided sufficiently clear explanations and definitions of this phenomenon, in addition, the need for its consideration and application is often disputed. There is no classification of forms and types of "green" financing, analysis of its impact on economic growth has not been developed, and the socio-economic consequences of environmental investments have not been worked out. The transition to energy-saving technology for operating houses depends on the success of modernization in the field of state scientific, technological and investment policy. The development of "green" projects can play a very important role in ensuring the economic security of the country. In the preparation and implementation of the strategy of "green" growth, science and education solve special problems. The new field requires knowledge and specialists. If they are available, it is possible to carry out a large-scale modernization of the productive forces and social relations in Azerbaijan in order to implement the program of "green" growth.*

**Keywords:** *environmental issues, climate risks, stranded assets, green finance, climate finance, green investment, financial innovations, green bonds*

### 1. INTRODUCTION

The globalization of "green" finance is an objective process that has coincided with global reforms and stimulated them, and a new stage in the development of the modern world financial system. Today is one of the priority tasks of ensuring sustainable economic development. The concept of "green" economy and "green" finance refers to a new direction of economic and financial knowledge, which is at the crossroads of different industries and environmental

disciplines. In the sphere of interests of "green" economy is included the provision of liquid resources for the development of society in the environmental direction. "Green" finances are also largely responsible for the efficient use and maintenance of the surrounding environment. Thus, "green" finances act as one of the necessary conditions for the sustainable development of society at the present stage. Ecologization of the economy has an important meaning, as long as the existing models of economic growth continue to deplete the reserves of natural assets and destroy the integrity of ecosystem services, from which depends economic activity. In the strength of the geographical location of Azerbaijan in the Caucasus region, this country is rich in unique biodiversity and diversity of landscapes. Azerbaijan is also endowed with the most important economic value of natural resources - the main of which are oil and gas - playing a key role in the economic growth of Azerbaijan. In recent years, the economy of Azerbaijan has been largely integrated into the global market. Large-scale economic reforms have increased the effectiveness of regulation and stimulated the diversification of the domestic economy, especially such sectors as agriculture, tourism and information and communication technologies. One of the most important factors of stable socio-economic development of the country are foreign investment. However, the extraction of oil and the development of industry for many years have serious environmental consequences for soil, water resources, atmospheric air, nature and indirectly for the health of citizens. Approximately 70% of the available surface water resources are heavily polluted due to the activities of industrial enterprises, as well as the inadequate treatment of domestic wastewater. Reduction of discharges from stationary sources was leveled with the growth of discharges from mobile pollution sources. The "green" transformation of Azerbaijan will stimulate economic growth and social development in such a way that natural assets left a source of material resources and services that depend on the economy and the well-being of the population. Ecology of the economic growth will allow to increase productivity and expand the introduction of innovations, to create new jobs and markets and to obtain additional tax revenues. In recent years, a large number of countries as a strategic model of national economic development have defined the concept of "green" economy and the transition to "green" economic growth (OECD countries, Japan, South Korea, etc.). Together with the achievement of a sustainable economic growth on a "green" basis, ie. without the destruction of the environment and the depletion of natural resources, it is impossible without the formation of an effective system of "green" financing.

## **2. "GREEN ECONOMY" AS THE MAIN DIRECTION OF ECOLOGIZATION**

The idea of a "green" economy was formulated by the expert community in the UNEP report "Global Green New Deal", published in 2008 at the height of the global financial crisis, as a strategy for creating a fundamentally new economic paradigm that will simultaneously bring the world economy out of recession and create the basis for a green economy, the transition to which will ultimately ensure the sustainability of economic, social and environmental development. A green economy is an economy that enhances human well-being and social justice, creates new conditions for decent employment, while significantly reducing environmental risks and impoverishment. "At its most basic, a green economy is a low carbon economy that uses resources efficiently and serves the interests of the whole community." The term "green economy" by the United Nations Environment Program (UNEP) is defined as an economy that promotes human well-being and social justice while reducing environmental risks. Green businesses are committed to an environment, society, communities and an economy that does not harm the economy, social development and environmental protection. "The concept of a "green economy" is designed to correct systemic market and institutional shortcomings of the prevailing development model and thereby make the economy a more effective instrument for solving problems of biosphere sustainability. In the new model, the main priority is given to market mechanisms for increasing energy efficiency, reducing

greenhouse gas emissions, switching to renewable energy sources "[Zhivotovskaya I.G., Chernomorova T.V., 2016.]. The "green" topic in macroeconomics brings together a wide range of scientific works. Such studies have been known since the late 1790s - early 1800s and date back to the works of T. Malthus and D. Ricardo. The first block of works (also presented by G. Hotelling, D. Meadows, J. Stiglitz, materials of the Club of Rome, etc.) until about the 1980s is devoted mainly to the growing problems of the use of limited and non-renewable natural resources, pollution and contamination environment, disruption of natural bioprocesses). In the 1980s - early 2000s, the terms "green" economy "and" green "financing" appeared, ideas of sustainable development and economic growth were developed, mathematical and econometric modeling was actively used (note the works of R. Solow, V.V., declarations and strategic programs of international organizations such as the UN, World Bank, etc.). Among modern research in the field of "green" finance and economics, "green" growth and innovations of the next technological order, one can single out the works of scientists P. Krugman, M. Mazzukato and K. Peres, K. Berensman and N. Lindenberg, Russian experts E.M. ... Zomonova, B.N. Porfirieva, B.B. Rubtsova [Arkhipova V.V., 2017]. A number of experts and reputable analytical and consulting companies, for example Bloomberg, view green finance as synonymous with investments in sustainable development projects and the production of environmental goods and services, including investments in reducing greenhouse gas emissions and adapting to climate change (the latter are classified as climate finance). Others, in particular PricewaterhouseCoopers (PwC), interpret green finance from the perspective of the banking sector as "a type of financial services and products used in making borrowing decisions, monitoring and managing risks taking into account environmental factors and contributing to the implementation of environmentally friendly investments and low-carbon technologies, projects, industries and enterprises" [Lindberg, 2014]. The transition to a green economy requires a large amount of resources, including financial ones. This transition contributes to the transformation of the global financial system, the creation of new institutional structures, a change in the financial architecture, the redirection of financial flows, the introduction of new financial instruments into circulation, the formation of a regulatory framework, prudential regulation, and a new culture of management of financial institutions. These transformations are called "greening the financial system." Supporting sustainable development by the financial system should have a positive impact on financial stability and can play a key role in finance. One of the directions of transformation of the global and national financial architecture is the formation of a "green" banking system like a "network" of financial intermediaries: "green" banks, development banks, as well as commercial banks with separate eco-financial divisions. The financial policy of banks, focused on achieving sustainable goals of society, is a tool for creating opportunities for the development of a "green" economy. From a theoretical point of view, the term "green finance" can be considered as an example of a "metalanguage" that describes and characterizes the interdisciplinary attraction and use of various knowledge about cash flow in the process of environmental management. The main emphasis falls on two conditions: (a) the ecological expediency of financial flows that fit into the framework of optimizing interactions in the "man - nature" system; (b) the use of financial levers of economic growth based on the development of the above system. Currently, three foundations of sustainable development can be distinguished: natural, social and economic environment, which intersect and constantly interact with each other. Each of them forms its own conditions for sustainable development. However, they do not exist autonomously, but interact with each other. The most critical area is the intersection of all three components. The mechanism of interaction is diverse, but gradually its main elements receive a monetary value, and the interaction between them takes place according to financial laws. As a result, there is a construction of a special type of finance, which is called "green" finance. The main manifestation of the impact of the environmental factor is recognized as the outlined transition

to a "green" economy in the world, which is impossible without building an effective mechanism for "green" financing. The essence of this mechanism lies not so much in the ability to increase traditional sources of financing for green investments, but in the ability to find new (innovative, non-traditional) sources of financing for investments. Despite numerous scientific studies of various aspects of sustainable development of the world economy in the aspect of providing financial resources, the issues of the emergence of new instruments for "green" financing of global economic dynamics remain insufficiently developed. However, there is still no generally accepted definition of the concept of "green" finance. This term describes a wide range of media for green technologies, projects, industries or businesses. A narrower definition of green finance refers to environmentally friendly financial products or services such as loans, credit cards, insurance, or green bonds. Other terms that are used to describe green finance include green investments and investment climate change. Thus, we can conclude about the variety of methodological approaches to the definition of green finance. It is advisable to understand "green" finance as a set of financial products and services (in the form of investments or lending) that take into account the impact on the environment and increase environmental sustainability, while ensuring activities to reduce the environmental and climatic risks of global economic development. Strengthening green finance can boost the high potential of green industries, foster technological innovation, and create business opportunities for the financial industry. Having studied various approaches to defining the essence of the concept, we can say that a "green" economy is an economic activity aimed at economic growth and social development, based on the development, production and operation of technologies and equipment for rational use of natural resources, as well as monitoring and forecasting climatic changes. Or a more global definition, proceeding from the result of the synthesis of general economic, sectoral, technological and civilizational approaches, when the "green" economy is viewed as an economy of sustainable growth with the dominance of environmentally friendly industries using alternative energy and resource-saving technologies, in which economic growth and the development of environmental culture the population is actively stimulated by the state environmental and economic policy (in order to preserve human civilization on Earth) [Vukovich, 2018, p. 128].

### **3. GREEN CHALLENGES IN GLOBALIZATION**

There are a number of quantitative estimates that make it possible to represent the magnitude of the consequences of the implementation of green challenges. Thus, the average losses from natural disasters are approximately \$ 181 billion / year, the need for infrastructure development until 2030 is \$ 5-7 trillion / year, the funds required for the rational use of energy resources and building a low-carbon economy by 2050 are \$ 1.1 trillion / year, respectively [B. Porfiriev, 2016]. According to UN estimates, \$ 22 trillion would be enough to comprehensively meet green needs, of which 55 and 20% are needed for infrastructure projects and climate change mitigation, respectively, 3-5% for maintaining biodiversity, developing renewable energy sources, solving the problems of energy efficiency and adaptation to climate change, 0.3-2% each - for the conservation and maintenance of oceans, forests, universal access to energy and agricultural support [Intergovernmental Committee of Experts on Financing Sustainable Development, 2015, p. 8-10]. Further, the annual potential demand for financial resources for solving global "green" problems by regions would need to be recalculated (according to optimistic forecasts for a decrease), taking into account the effectiveness of investments. Thus, the problems listed above have three important features: a global character, an upward trend and a systemic impact on all spheres of public life. "Green" challenges (natural resources, climatic, environmental), including such sections as: Protection and preservation of ecosystems; Creation of a new useful quality in the form of environmentally friendly goods, services and programs to maintain the environment; Improving the efficiency of using



renewable and non-renewable energy sources; Reducing the negative consequences of human activities on the environment; Supervision and management of hydrocarbon emissions; Recycling and disposal of waste; Control and regulation of the level of industrial pollution; Water supply, sanitation and hygiene; Adaptation to climate change [Lindberg, 2014]. The transition to a green economy requires a large amount of resources, including financial ones. This transition contributes to the transformation of the global financial system, the creation of new institutional structures, a change in the financial architecture, the redirection of financial flows, the introduction of new financial instruments into circulation, the formation of a regulatory framework, prudential regulation, and a new culture of management of financial institutions. These transformations are called "greening the financial system." Supporting sustainable development by the financial system should have a positive impact on financial stability and can play a key role in finance. One of the directions of transformation of the global and national financial architecture is the formation of a "green" banking system like a "network" of financial intermediaries: "green" banks, development banks, as well as commercial banks with separate eco-financial divisions. The financial policy of banks, focused on achieving sustainable goals of society, is a tool for creating opportunities for the development of a "green" economy.

#### **4. THE "GREENING" OF THE FINANCIAL SYSTEM**

The "greening" of the financial system contributed to the development of the theoretical apparatus of banking, the introduction of the concepts of "green", "sustainable", "responsible" banking into scientific circulation. The first references to green banking as an environmentally oriented bank are associated with Triodos Bank, founded in 1980 in the Netherlands. In 1990, Triodos Bank embarked on a Green Fund strategy to finance environmentally friendly projects, later called green initiatives. Following the example of Triodos Bank, banks around the world are starting to implement green initiatives in their activities. In this regard, "green" banking has been defined as any form of banking services, thanks to which the country and the nation receive environmental benefits, "green" banking is engaged in "green" banks. Officially, "green" banking has existed since 2003. Despite the fact that the banking business is inherently environmentally neutral, the original idea of a green bank was to minimize environmental damage from the bank itself (reducing paper consumption, switching to electronic document management, using alternative energy sources, etc.). Also, banks could voluntarily participate in financing individual environmental projects. In 2007, a new financial instrument appeared on the world financial market - climate and "green" bonds, the first issuers of which were Development Banks. Later, separate "green" Development Banks began to be created as government financial institutions. A 2015 report by the Organization for Economic Cooperation and Development (OECD) defines a green bank as a publicly owned company created specifically to promote private investment in low-carbon, climate-resilient infrastructure and others. "green" sectors such as, for example, water and waste management; Green Bank's mission is to leverage innovative finance to accelerate the transition to clean energy and combat climate change. In the studies of the last decade, the "green" bank is considered not only as a state, but also as a commercial financial institution, acting as one of the instruments of the "green" economy, promoting environmentally sustainable and socially responsible investments, attracting entrepreneurs to green production by financing environmental projects ... Research on green banking is carried out in two directions: internal and external. The focus of the internal direction of research is the internal bank organizational business processes to reduce the negative impact on the environment, the focus of the external one is the attraction and provision of financial resources for the "green" economy [Miroshnichenko O.S., Brand N.A., 2021]. China also has significant ambitions in green financing and the creation of green investment banks.

In 2016, the Chinese Council for International Environmental Cooperation and Development recommended the creation of a National Green Development Fund with an initial capital of 300 billion rubles. (\$ 47 billion). As conceived by the organizers, the bank should also attract private capital in the relevant area on the national and international capital market. In 2018–2035 China's investment needs for renewable energy sources will amount to 1 trillion. It is assumed that the new bank, with its capital and through the formation of pools, organizes the accumulation of capital for a significant part of the planned investments. At the national level, the first formal rules for issuing green bonds were published by the People's Bank of China at the end of 2015 to stimulate private investment in the country's transition to a green economy. The need for such investments is estimated at 2 trillion. yuan (330 billion dollars) per year, of which 85% should provide funds from the private sector in China itself and from abroad [Porfiriev, 2016].

## **5. GREEN ECONOMY IN AZERBAIJAN AS THE MAIN DIRECTION OF GREENING**

A milestone in the formation of a green economy in the international arena was the UN Summit on Environment and Development, which was held in 1992 in Rio de Janeiro, bringing together 178 government delegations. At this forum, the concept of sustainable development was developed, which implies that all countries should develop their own programs that contribute to the greening of the economy. The theme of the development of the "green" economy in recent years has become increasingly relevant in the world and in Azerbaijan. The growing interest in this problem is evidenced by the fact that a number of events at various levels have been held in the country this year. Recycling, efficient use of natural resources and solid household waste are among the priority areas of the green economy. This contributes to the improvement of the ecological situation and the rational use of natural resources. Prospects for the development of Azerbaijan in the direction of implementing the ideas of a "green" economy, first of all, are determined by the fact that Azerbaijan is a country of rich natural resources and significant human potential. This today determines both the strengths and weaknesses of the country in relation to the prospects for the development of the "green" economy. Transition to a "green" economy, environmentally sustainable development Azerbaijan implies a transition from an extensive export-raw material model of economic development to modernization. Key indicators of such development are indicators of sustainable development, including indicators of nature and energy intensity, human development indices, adjusted net savings, Millennium Development Goals. Within the framework of the international project "Greening the economy in the countries of the Eastern Partnership", in which Azerbaijan is also taking part, European specialists plan to share their experience and train experts in the republic on resource efficient and cleaner production. 2 Work on this component of the program provides for the selection of sectors, subsectors of specific enterprises, where it is advisable to implement this direction for its subsequent replication. The following 3 sectors are proposed as priorities - food and beverage production, chemical industry, building materials. At the same time, the countries participating in the project themselves have the right to choose a sector based on environmental priorities and areas of industrial development in order to achieve the maximum positive socio-economic and environmental effect. The main strategic document on Azerbaijan's policy issues, "National Priorities for Socio-Economic Development: Azerbaijan 2030", includes environmental objectives. Attached to it is an Action Plan for Improving the Environmental Situation and Efficient Use of Natural Resources for the period 2020–2030. In 2016, the Ministry of Economy presented the details of the Strategic Roadmap aimed at diversifying the economy through the development of agriculture, SMEs, the service sector, manufacturing, tourism, logistics and trade. Although the Strategic Roadmap for 2016 still focuses on the oil and gas sectors, the State Strategy for the Use of Alternative and Renewable Energy Sources

(2012–2020) has become an important document, on the basis of which government decisions in the energy sector are made. Azerbaijani President Ilham Aliyev instructed the government in the coming years to reduce environmental risks affecting economic and demographic growth. This instruction is one of the points of the document "Azerbaijan 2030: National priorities for socio-economic development." "The ecological environment must be balanced with economic growth. The existing resources must be restored, unused land put into circulation. The country's need for high-quality water must be met through the efficient use of water resources. " During the strategic period, it is planned to increase the use of alternative and renewable energy sources. "Based on the scientific and technical potential, the share of alternative and renewable energy sources in primary consumption should be increased in all sectors of the economy, and the impact on climate change should be reduced. Using environmentally friendly vehicles will have a positive impact on the environment and air quality".

## 6. CONCLUSION

In general, technological barriers, lack of innovation potential, insufficient demand for innovative products, lack of scientific developments and discoveries and, in general, low economic returns from environmentally oriented innovations, lack of environmental education of citizens are usually singled out as the main obstacles to green economic growth. A green economy is an economy that balances the environmental and economic interests of society for sustainable development. This is a trend in economic science that has formed in the last two decades, within which it is believed that the economy is a dependent component of the natural environment, within which it exists and is a part of it. Moreover, speaking about the greening of the modern economy, scientists around the world use several terms, such as "circular economy", "green economy", "bioeconomy". One of the main problems hindering the development of a financing mechanism for "green" investments both in the world and in Azerbaijan is the lack of an agreed position shared by all stakeholders on what should be understood as "green" investments. Lack of common understanding leads to the formation of methodological, regulatory and economic contradictions. All green projects require significant funding, while in most cases green business models and projects are highly risky and unconventional. In general, "green" finance paves the way for integrated approaches and solutions, since many problems are intertwined in them and the foundations of our existence - natural, economic and socio-cultural - interpenetrate.

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# DIGITAL TRANSFORMATION INDEX BASED ON THE DIGITAL MATURITY MODEL: CASE STUDY OF CROATIA

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## ABSTRACT

*In the paper, the author defines a digital transformation index based on the digital maturity model and looks into the state of digital transformation in several large companies in Croatia. The digital transformation index sets strategic priorities and develops comprehensive action plans in line with the company's overall strategic objectives, depending on the degree of business stakeholders' involvement, new technology and initiative usage, business model innovation, the culture of sharing, as well as agility and openness in business. In the digital maturity model, special emphasis is given to the degree of introduction of cryptocurrencies and crypto domains in business. The digital transformation index indicates the degree of disruptive innovation which, in such circumstances, arises from the level of companies' digital transformation. Digital technologies are a part of digital economy, and through various system improvements – from incremental to radical – they transform the business processes, products and services of all market entities. Levels of mobile technology development, social networks, cloud computing, processing of large amounts of diverse data, use of sensors and the Internet of things, innovative business models, artificial intelligence, virtual and augmented reality, cryptocurrency and crypto domains in selected companies and the achieved degree of business digitalisation and digital content exchange in Croatia are all explored in the paper. It is proposed in the conclusion that it is only the organizations with high levels of digital transformation, which have successfully implemented the processes of digital business transformation, that create the necessary competitive market differences and, as pioneers of these changes, pose a threat to traditionally oriented organizations. The research has shown that organizations with new business models based on digitisation and digitalisation of business are ready for the coming disruptions and will remain leaders of market change.*

**Keywords:** *digital transformation, digitisation, digitalisation, digital transformation index, digital maturity model*

## 1. INTRODUCTION

There is increasingly less time for smart and safe adaptations to the new ways of doing business which incorporate various new software solutions. Business digitisation and digitalisation processes rapidly impose the implementation of various applications which help companies continue their operations smoothly. Everyday business in companies is improved by a series of new digital services and smart analysts that analyse user habits. There are opportunities for business improvement, but they must be introduced and adopted in a planned manner, and in accordance with set strategic business objectives, as well as the implementation of necessary adjustments based on digital transformation procedures. Every company must strive for digital maturity through the processes of digital business transformation. Digital business models differ from traditional ones in that they are based on information instead of material resources. Today's managers are aware of the need to apply new technologies, but they are often faced with rapid change, so they do not know when and how to initiate and implement the necessary changes. Managing change due to employee resistance, the lack of strategy and organizational rigidity and the lack of key resources have become extremely challenging. Exponential development of technology and innovative solutions requires rapid business transformation. The focus on service users remains the primary goal of any change.

Adapting the business model that ensures business sustainability and greater customer satisfaction is the most important task of digital business transformation. The purpose of this paper was to research how the degree of digital transformation of a company's business could be measured. By measuring it in several selected companies, the author hoped to confirm the developed model and the validity of measurement. The aim of this research was to determine, through analysing the current situation and implementing digital business transformation, the way in which the degree of digital maturity of the company can be determined, i.e. the degree of success of adapting the business model to the needs and habits of users. The research subject encompasses the possibilities and ways of determining the degree of digital maturity before and after the digital business transformation procedure in order to fully evaluate the achievements of the implementation of digital transformation and business adaptation to new conditions. The digital transformation index from selected companies in Croatia was tested and discussed in this paper. The author uses existing scientific literature and presents previous research, using compilation and description methods. The method of synthesis and classification helped define the index of digital transformation, which was tested on selected companies by using the inductive method. The answers to the following questions are given in the paper: Is it possible to simply express the practical success of the necessary changes that have occurred because of technological developments, compared to the previous state of business? What is the level of digital transformation of the company's business and what level do they want to reach in the following period? To what extent have companies progressed in terms of their own digital skills, and is that enough to sustain growth and development of competitiveness of companies in the global business environment? How do current market regulations, burdened with paternalistic standards, paralyse the use of new technologies and slow down the creation of digitally mature companies that strive to pay in cryptocurrencies and create new crypto domains based on blockchain technology?

## **2. DIGITAL BUSINESS TRANSFORMATION**

New technologies bring new needs, expectations, and requirements. The development of the Internet of Things, virtual assistants, smart devices and holograms continues at a rapid pace while the level of their communication with users increases, enabling easy ordering and use of the company's services. Previous research has shown that new technologies are being partially introduced in Croatia, but the existing business, organizational and management models remain the same. As long as the management capacities of Croatian companies have not reached technological fluency, i.e. as long as they are unable to introduce new organizational models that enable new technologies, digital maturity is nothing more than a concept. Digital maturity is achieved after the business' digital transformation which is set to increase the share of transactions with customers and suppliers through digital channels, advanced use of analytics and the establishment of appropriate management frameworks. Increasing the productivity and competitiveness of Croatian companies can only come from digital maturity, which is conditioned by the use of digital technologies in improving the business environment. In a study by the World Competence Center (IMD, 2021) it is estimated that if companies started using artificial intelligence early enough, they would double their productivity. It is also estimated that there already is potential to automate half of the current economic activities. A study conducted by Gartner Consulting (Gartner, 2021) shows that more than three-quarters of companies consider working from home an option for at least a fifth of their employees. A survey by the Equestris agency (Equestris, 2020) finds that soon, half of the users in Croatia will buy daily goods online daily. The technology, in terms of telecommunications infrastructure, data centers, blockchain platforms and cloud services, is ready for new business models. Implementing digital business transformation includes reviewing existing ways in which business is done and further digitisation and digitalisation of business.

It was shown in a survey carried out by Apsolon (Apsolon, 2020) that most Croatian managers transform their organizations by analog-to-digital conversion of existing processes, in other words simply by implementing software as part of the development of information and communication technologies. The survey is based on subjective statements of Croatian company managers and assesses the state of digital transformation of the Croatian economy. Its aim was to analyse digital readiness of Croatian companies from different economic sectors and use the results to develop proposals, recommendations, and guidelines for improving digital capacities, as well as Croatian economy as a whole. The survey was conducted in financially successful companies and, through the survey, researchers tried to find out the state of the companies' digitalisation, digital readiness, digital strategy and digital transformation. According to the results, the state of digitalisation of the Croatian economy was assessed as poor, with 47% of respondents believing it to be weak, and 12% of them very bad. Large companies scored worse. The research is in correlation with the DESI survey (European Commission, 2021, p. 19) conducted by the European Commission, in which Croatia ranked 19th out of 27 in the category of less successful countries. Research to date indicates that reaching digital maturity involves rethinking and transforming the way we manage and do business, as well as business digitalisation.

### **2.1. Management method**

Research on transformation (Saldanha, 2019; Erjavec et al. 2018) shows that it primarily depends on the full support and dedication from the company's management and on a clear digital transformation strategy. It is important that the management takes on the responsibility for preparation, progress tracking and taking all the necessary transformation activities, with no unnecessary and inefficient work delegation. Research shows that inadequate digital skills of the management is one of the most important reasons for failed business transformations because the management cannot assess how to use the available technologies most efficiently in business. The consulting firm McKinsey estimates (Saldanha, 2019, p. 44) that less than 20% of managers possessed adequate digital competencies, and less than 5% of the companies had a so-called technology committee which could make up for these shortcomings to a certain degree. The management has to accept the responsibility of making important decisions in regard to business digitalisation and transformation, as well as to monitor the implementation and work towards removing obstacles in these processes. Some research emphasizes (Erjavec et al., 2018, p. 120) that management's knowledge and skills are often too low to launch a digital transformation. There are also positive examples of senior management taking responsibility and engaging with these processes cited in the literature. A good example of this is Singapore, a country in which the Prime Minister personally took the responsibility for the implementation of the country's digital strategy, which in turn helped make the country a global digital leader (World Economic Forum, 2016). A more detailed overview looks at digital transformation and its effect on all three organisational dimensions: external (focused on digitally enhancing users' experience and changing the entire business life cycle), internal (affecting business, decision making and organisational structure) and holistic (all business segments and functions within an organisation, which often leads to completely new business models) (Kaufman & Horton 2015; Schuchmann & Seufert 2015; Hess et al., 2016). Overall, the researchers agreed that digital transformation is associated with a fundamental shift towards achieving superior performance in all three dimensions.

### **2.2. Digitisation of Business**

Digital technologies, as an important factor of digital economy, use digital goods in a computer environment. The most important digital technologies (Spremić, 2017) are undoubtedly mobile technologies, social networks, cloud computing, advanced data analytics, rapid knowledge

discovery, various sensors, and the Internet of things. Simultaneous application of digital technologies, incorporation into products and devices, ability to extract digital content from devices, analysis, and interaction as well as the ability to quickly distribute digital content, intensive exchange, the ability to digitise business, to transform business models and to create digital platforms are the hallmarks of digital technology. A simulated digital environment that uses augmented reality, virtual reality and blockchain technologies, together with social media concepts, creates space for a wide range of user interactions. Digitisation of business, i.e., the use of digital technologies, can help in successfully solving the challenges that every company in today's globalised world is facing. The only answer to ever-increasing business challenges, like high maintenance costs, transportation, storage, retaining and attracting quality labour, remote process management, etc., can often be combated by companies only through the use of digital technologies.

### **3. DIGITAL MATURITY**

A review of the scientific literature makes it easy to see that the interest of researchers and the number of scientific papers on research in the field of digital maturity is growing as a consequence of the digital transformation of business. Various models of digital maturity have thus been developed. In their review of scientific literature, Kruljac and Knežević (Kruljac & Knezevic 2019) analysed the existing digital maturity models for businesses. An analysis of twenty models was conducted, with the goal being model standardisation. Special emphasis was put on factors and indicators built into the model. Through their work, the authors pointed out the scientific shortcomings of the existing models, especially the fact that the existing models were mostly descriptive and linear, as well as the fact that the models lack a better connection with the theory.

#### **3.1. Digital Maturity Model**

By definition (Becker, Knackstedt and Pöppelbuß, 2009, p. 213), company maturity models are applied for both the overall business of a company and the maturity management of specific functions. They represent a number of levels which, according to the authors, make up the “expected, wanted and logical path from the initial state to maturity” and “serve as a benchmark for assessing the position on the evolutionary path, as well as provide criteria and characteristics which need to be fulfilled to achieve a certain level of maturity.” In published scientific research by Remaneu, Haneltu, Wiesboecku and Kolbeu (2017, p. 144), the authors state that “the maturity models offer a way for the target facility, be it specific business units, organisations or an industry as a whole, to progress towards the desired state.” A maturity model typically includes areas with several factors which directly affect the level of its development. These areas and associated factors can be determined with a maturity scale (De Bruin, Freeze, Kulkarni and Rosemann, 2015). The authors point out that company maturity models can be divided into descriptive (which determine the existing states), prescriptive (which give development guidelines) and comparative (which compare a company to its competitors). There are a number of particular features of digital maturity models for businesses. A digital maturity model represents the starting point and the end result of the implemented digital business transformation and is usually related to the digitisation and digitalisation of business processes. A digitally mature company that has fully implemented the digital transformation of business performs all processes with the help of advanced digital technologies by following strategic guidelines and putting customer relations to the forefront, thus using the technologies even more. This in turn encourages and creates an advanced business culture (Chanias and Hess, 2016). When operationalising the measurement of the degree of digital maturity, it is necessary to consider: How to objectively determine the index of digital transformation of a company based on its degree of digital maturity and how to objectively compare it with other companies?

Using the overview of analysed models of digital maturity (Kruljac, Knežević, 2019) in Table 1, we can define the model of digital maturity which consists of five areas: user relations, strategy development, use of technology, business process development and culture, people, manner and organisation of management. Each of these areas has associated factors which significantly contribute to the condition and development of a specific area.

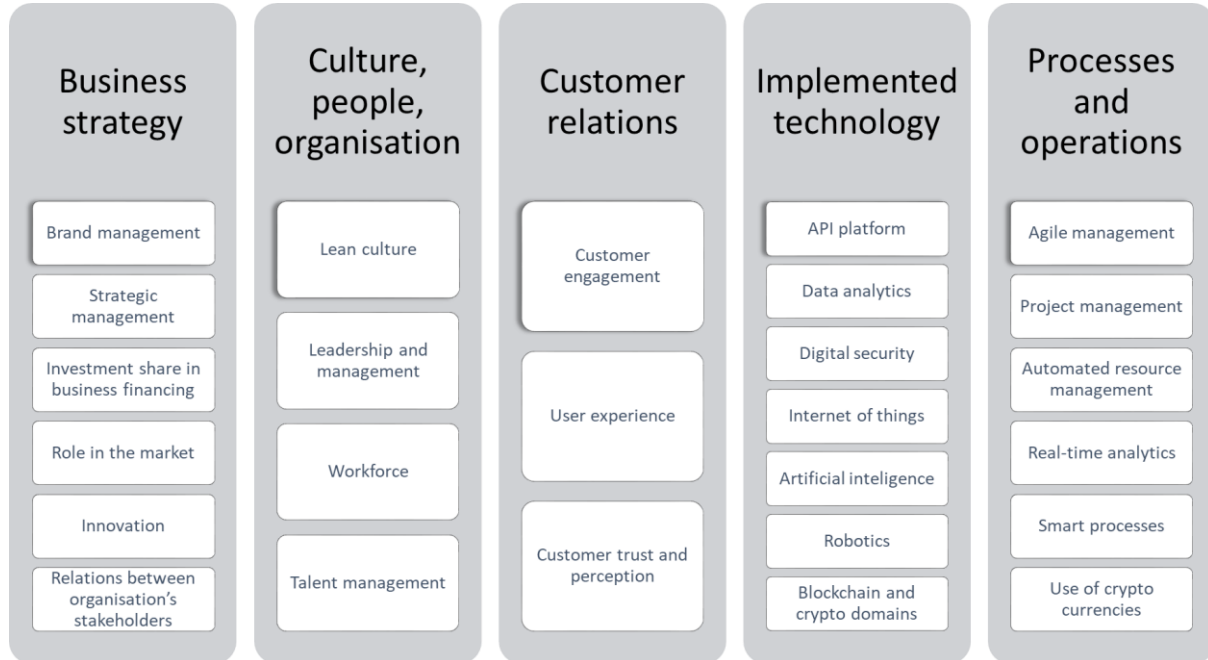


Table 1: Areas and segments of digital maturity models

(Source: Author's creation according to: [https://www2.deloitte.com/global/en.html?icid=site\\_selector\\_global/deloite-digital-maturity-model.pdf](https://www2.deloitte.com/global/en.html?icid=site_selector_global/deloite-digital-maturity-model.pdf) (16 January 2022))

The aim of this paper is to develop a digital transformation index based on changes which affect the state of the showcased digital maturity model. Thus, phases of the digital maturity model in which each segment is located are based on the development of the segments of the five areas mentioned earlier. These phases are: insufficient, basic, defined, advanced and optimal. Each of these phases is shown with an appropriate index to make the model easier to present. In further research with defined areas of digital maturity, a certain quantitative significance was assigned to each individual factor and an index of the overall model was presented.

### 3.2. Digital transformation index

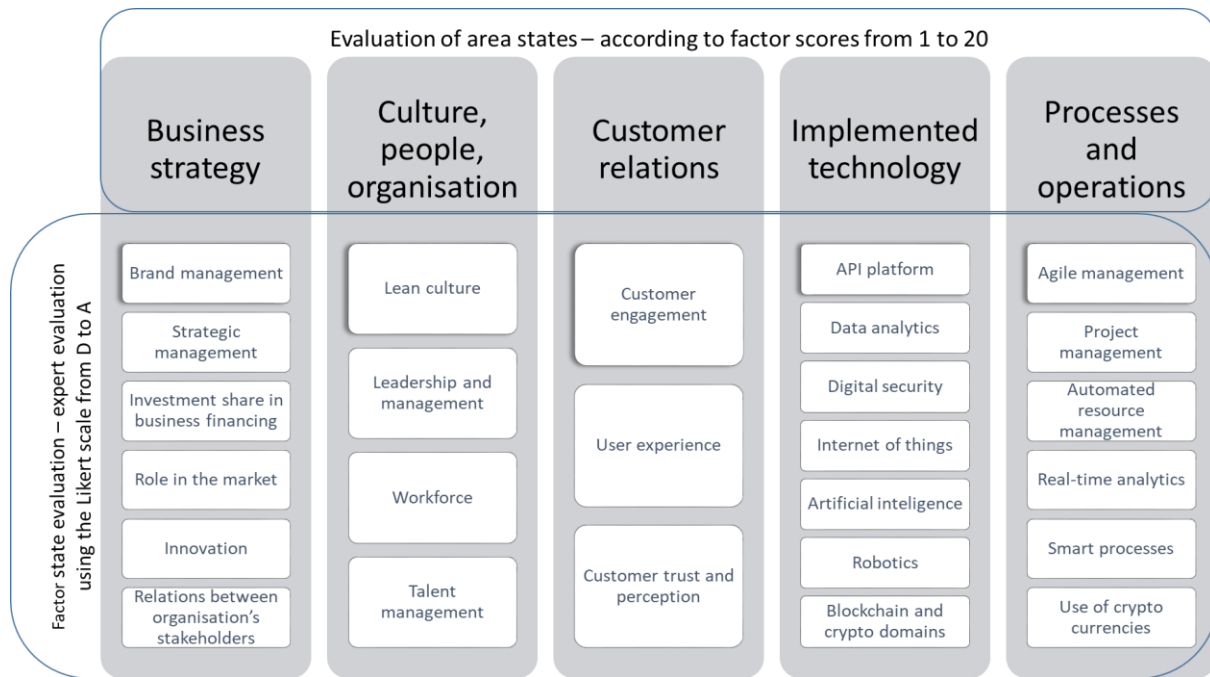
In the scientific literature (Bogner et al., 2016), index formation is mostly based on scoring models connected to individual factors which consist of question blocks. Through these questions, researchers seek to find the optimal level of digitisation and digitalisation of business in the defined scope of the research. One part of the research focuses on the level of business automation. In it, methods of process conduction are determined (manual, automated, self-regulated). It should be emphasized that it is possible to make divisions according to the degree of automation, and that a certain degree of process self-regulation should be sought only in production processes. To calculate the digital transformation index, it is necessary to examine the influence of individual factors and relate them to the desired effect. Operationalisation of the actual application of the activities according to each of the factors is assessed to the extent of their realisation in a specific area (not planned; planned; realised). At the same time, their impact and the success of their implementation are assessed. The analysis of each factor must be based on an increase in: productivity, availability or customer satisfaction.



At the same time, the degree of realisation of each activity is also assessed (not realised; small change; significant change). In this way the change achieved by the digital transformation of business can be determined. We can also determine the current digital maturity of the organization with the digital transformation index. The state of digital transformation of a company is assessed on a scale from 1 to 100. Each organization, even if their level of digital maturity is insufficient, starts with a minimum index of 10, based on its very existence and continuous business. The rapid development of technology and the need for constant adjustment makes it virtually impossible for any organization to be rated as optimal, i.e., to have an index of 100. Due to these facts, the digital transformation index will range from 10 to 90 in most cases. Each individual factor will be evaluated using the Likert scale from E to A, where the score of E represents an insufficient state and A the optimal state of an individual factor, based on the previously described levels of automation or realization of an individual activity. Depending on the score of each factor (according to the representation of each individual score in an area), each score in an area can range from two (insufficient) to twenty (optimal). The total sum of these areas makes up the digital transformation index based on the described digital maturity model. The described model, with the evaluation method shown in Table 2, is used to assess the current situation, to propose activities to be implemented through the digital transformation strategy and to assess the situation through planned activities as a result of the conducted process. This way, new technologies can, as necessary, be implemented through the processes of digital business transformation, thus changing the existing business, organisation, and management models. The process is carried out in accordance with the developed strategy of digital transformation as long as the management capacities become technologically fluent, i.e., able to introduce organizational models that enable the application of new technologies. In this case, digital maturity is achieved after the business' digital transformation through targeted transaction share optimisation with customers and suppliers through digital channels, advanced use of analytics and the establishment of appropriate management frameworks. Based on the conducted assessment, organizations can be classified according to the value of the digital transformation index. These companies can, within the scope of their activities, be described as:

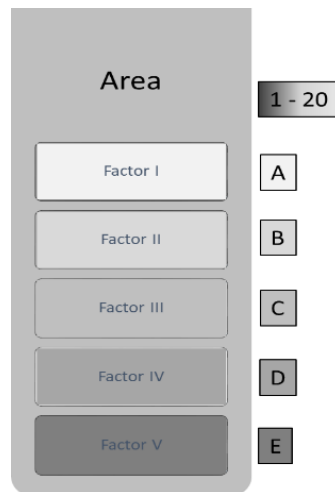
- Leaders (high degree of automation and realization of value chain automation with implemented self-regulation of production processes and significant digital maturity in corporate business results);
- Participants (partially automated processes and above-average integrated production processes without significant digital maturity in the corporate business results);
- Technologists (high degree of business automation but average degree of value chain automation and implementation of self-regulating production processes, with high costs but low levels of digital maturity in the corporate business results);
- Traditionalists (remain in their existing structures and processes as long as there is expressed customer satisfaction without digital maturity in the corporate business results).

*Table following on the next page*



*Table 2: Method of evaluating the areas and factors of the digital maturity model (Source: Author's work )*

In this way, the index of digital transformation, resulting from changes in the state of digital maturity model, goes through phases in which the index score of up to 20 describes insufficient transformation, up to 40 basic, up to 60 theoretically required or defined, up to 80 advanced and up to 100 optimal.



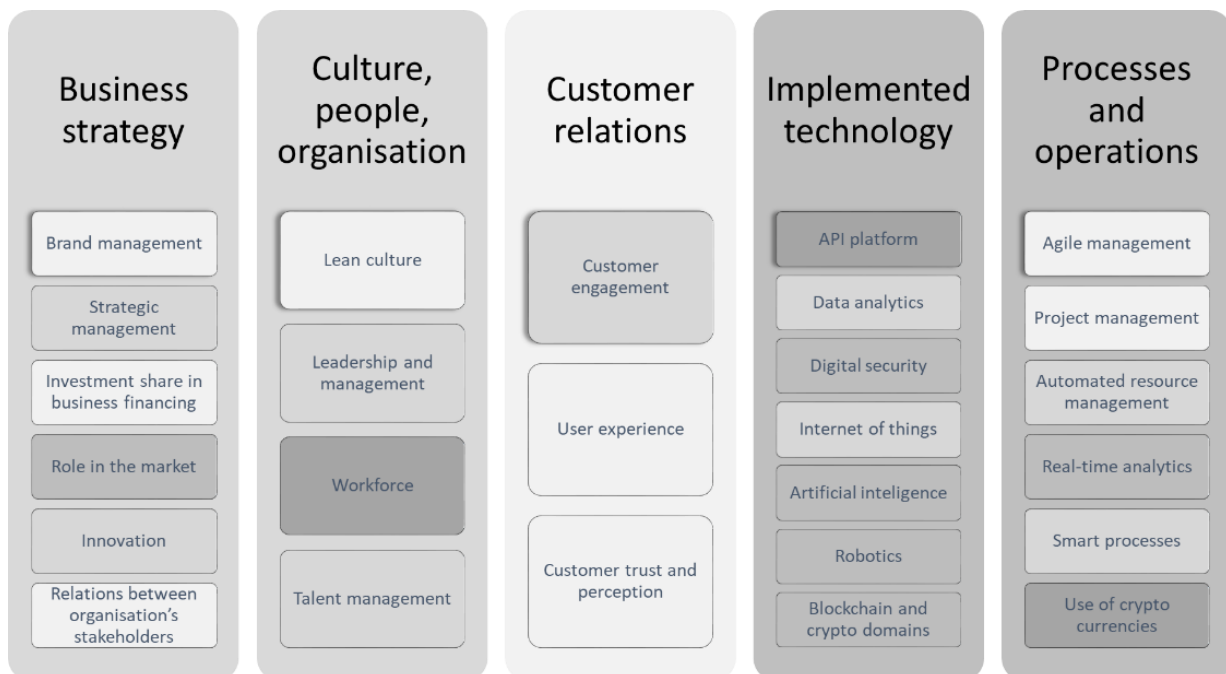
*Table 3: Possible evaluations of the areas and factors of the digital maturity model (Source: Author's work)*

Each phase, shown by an appropriate description or index in Table 3, illustrates the state of the companies and pinpoints the required activities. The goal of these activities is to simplify tracking the development and adaptation processes.

#### 4. DIGITAL TRANSFORMATION INDEX OF CROATIAN COMPANIES

Using the above-developed model, an analysis of the state of digital transformation in five selected large companies in Croatia was made. The goal was to determine how complex and applicable the process was.

Large companies with different scopes of activities (manufacturing, trade, services) were chosen. Each had a different estimated degree of digital maturity. The research showed that the model is applicable no matter the activity or degree of digital maturity of the company and that, in a very short time span and with the help of experts in specific fields, the degree of digital maturity can be determined and necessary decisions regarding the needs and scope of the strategy of digital business transformation can be made. The following are examples of research conducted in an organization whose main function is mass production, a company engaged in wholesale and retail of technical products, and a large company that provides services in the field of business informatisation. The above three examples show the degree of possible application and the situation in selected companies graphically and with the digital transformation index clearly marked. Table 4 shows the analysis of a company that deals with mass production of technological equipment and, considering the above-average developed business strategy and internal business organization, as well as the optimal relationship with customers, the average state of implemented technology in business and the average state in processes and operations, the index of the company was estimated to be 74 ( $16 + 16 + 18 + 12 + 12$ ).



*Table 4: Analysis of a company for mass production of technological equipment  
(Source: Author's work)*

Table 4 showcases the state of the company's transformation. From this data, we can see which areas need to be further transformed. Research showed the following results for this specific example: the workforce was inexperienced (average time spent on new tasks was under two years, level of education was not always proportional to the assigned job); plans for the api platform were being prepared; usage and possibilities that cryptocurrencies bring were not yet considered. Table 5 shows the analysis of a company selling technological products. Developed business strategy and internal organization were shown to be at an advanced level, but the customer relationship and implemented technology in business were insufficiently developed. Processes and operations were deemed advanced. The index of the company was estimated to be 72 ( $16+16+12+12+16$ ).

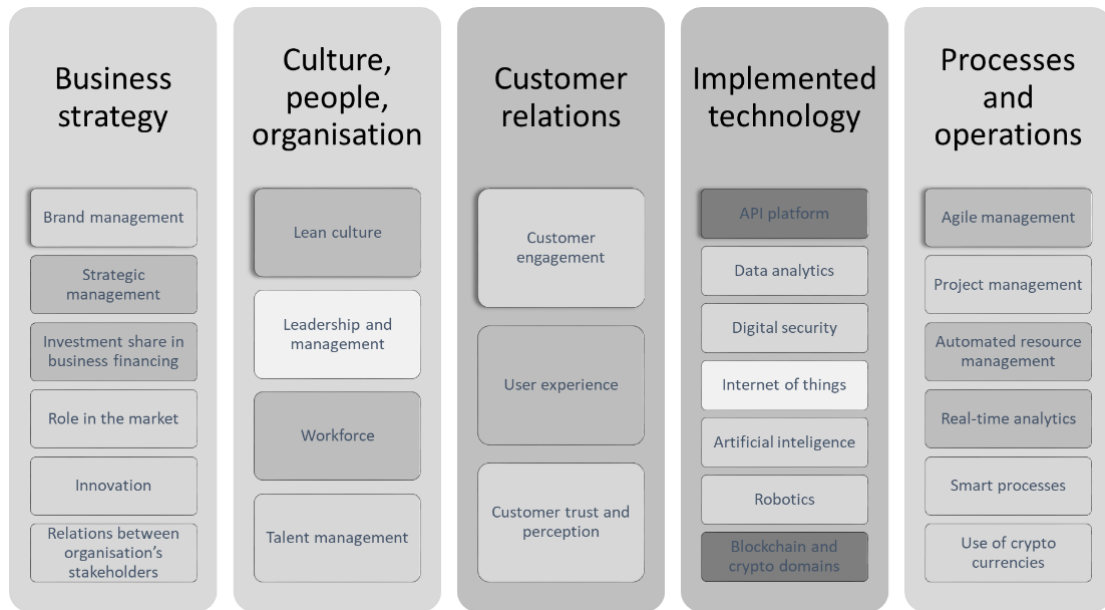


Table 5: Analysis of a company selling technological products  
(Source: Author's work)

Table 5 showcases the state of the company's transformation. From this data, we can see which areas need to be further transformed. Research shows that in this case there is still a lot of work to be done in creating an *api platform* and analysing the possibilities of using *blockchain technologies* in business. The other areas were generally transformed, and the company had adapted to the usage of existing implemented technologies with the possibility of further development of *Lean culture* in business and further *workforce* education. Table 6 shows an analysis of an IT service provider company. The business strategy has clearly been developed in this company, but internal organisation and customer relations are insufficiently developed. The necessary business technologies have been implemented to a basic degree, just as business processes and operations have been developed. The index of the company was estimated to be 52 ( $12+12+12+8+8$ ).

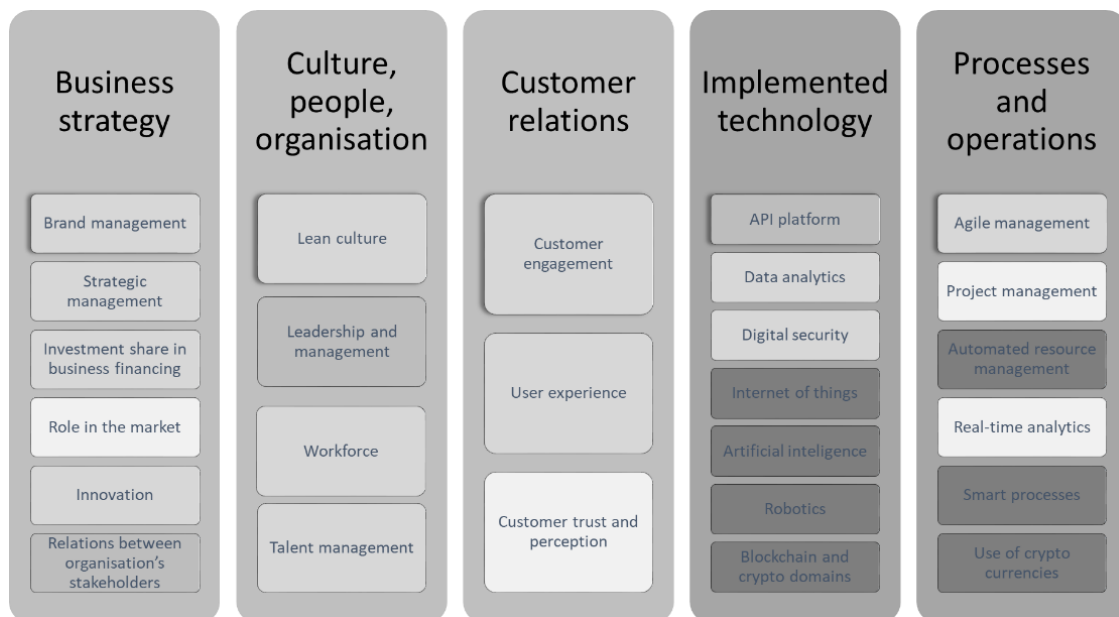


Table 6: Analysis of an IT service provider company  
(Source: Author's work )

Table 6 showcases that the company still has a lot of areas that need to be further transformed. Research shows that there is a lot of work to be done in implemented technologies, especially in regard to new fields of technology like the *Internet of things*, *artificial intelligence*, *robotics* and *blockchain technologies*. In the area of processes and operations, the greatest attention will need to be paid to automated process management and the establishment of smart business processes. The company has an organisational culture and is customer-oriented in business, but its technologies and processes are not yet transformed in accordance with its needs. The presented analyses show simplicity and clarity in presenting the situation and calculating the digital transformation index in selected companies. The totality of areas and their factors reflect all the features of digital maturity of the company, so the calculation and presentation of the situation are meritorious for expressing the index of digital transformation of the analysed companies.

## 5. CONCLUSION

In a time of a developing global business environment imbued with constant political, social and climate tensions, the users are becoming increasingly demanding. They expect simple processes of interaction from economic operators in different ways and at all times. Providing so-called multi-channel offers is becoming a baseline for retaining and attracting customers. The companies must strive towards operative excellence with the help of digitisation and digitalisation of business. It is necessary to create a competitive advantage in the market by providing superior customer service, which is in turn conditioned by good financial results. This can be achieved through various programs of operational excellence. Strengthening the user experience, increasing sales performance, raising productivity, increasing organizational efficiency and reducing the complexity of business processes improves the digital maturity model. The implementation of all these processes is possible through digital business transformation, which will vary depending on the degree of digital transformation of the company. Connected by digital technologies, users in a global business environment communicate, cooperate, connect, order goods and services, track business processes and actively participate in strategic developments. Therefore, Companies today need to constantly review existing business models and find ways to effectively differentiate themselves from the competition. By performing a necessary analysis, checking all the factors of the digital maturity models and, finally, determining the digital transformation index, the company must define key steps towards optimal digital business transformation in order to achieve a competitive advantage. Through active application of digital technologies, it can create a market difference and pose a threat to other organizations in the industry. Digital business transformation is thus becoming the best way to adapt to rapidly emerging disruptions. This research has demonstrated the need for a simple digital transformation index based on a general digital maturity model with specific factors dependent on the type of activity and time in which the global business environment is located, taking into account the rapid development of technology and business innovations. It is only the organizations with high levels of digital transformation, which have successfully implemented the processes of digital business transformation, that create the necessary competitive market differences and, as pioneers of these changes, pose a threat to traditionally oriented organizations. Research has shown that organizations with new business models based on digitisation and digitalisation of business are ready for the coming disruptions and will remain leaders of market change. Further research will show the extent to which there is a difference in the assessment of the digital transformation index in large, medium, and small companies, and the extent to which factors affecting the areas of digital maturity models should be adjusted according to the types of activities and time. In this way, it would be possible to assess the universality of the presented index and its daily applications in the economy.

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## FROM BUSINESS ECOSYSTEM TO THE PRESENT: A LITERATURE REVIEW

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### ABSTRACT

*This article (working paper) aims to show the evolution and compare different ecosystems' models (business, innovation, entrepreneur and knowledge ecosystems). To complete this action a literature review was carried out, using the Methodi Ordinatio, which analyzed 531 articles and presented the most relevant thirty (30) studies with this metaphor, identified by the methodology, keeping in mind the year of publication, citations, and the journal's impact factor. There is a growth in studies on ecosystems, but there are still divergences in the definitions presented. In this sense, the present study identifies gaps and points out suggestions for future research.*

**Keywords:** *Business Ecosystem, Entrepreneurial Ecosystem, Knowledge Ecosystem, Innovation Ecosystem*

### 1. INTRODUCTION

Moore (1993) introduced the term Ecosystem to analyze the corporate environment. Establishing a nexus with the natural ecosystem, the author proposed the Business Ecosystem. Subsequently, several types of ecosystems emerged, such as Entrepreneurial Ecosystem (Prahalad , 2005), Innovation Ecosystem (Adner, 2006) and Knowledge Ecosystem (van der Borgh , Cloudt and Romme , 2012). Although the increase of the quantity of publications on this topic, there is not a consensus on the concepts, definitions and theories of these ecosystems (Scaringella and Radziwon, 2018). Sometimes it appears as a synonyms, similarly to what occurs with the term Business Ecosystem and Innovation in some contexts due to the lack of a delimitation (Gupta, Mejia. and Kajikawa, 2019). In this sense, the aim of this study is to understand the definition of these ecosystems and identify their similarities and differences. To reach it, a systematic review of literature was carried out using the methodology Methodi Ordinatio. The search was carried out in the Scopus, which returned a significant number of articles. This article is divided into four sections, and this is the first one, contextualizing the theme, the problem, and the purpose of this paper. The second section details the methodology. In the third section the results are presented. Finally, the last section brings a conclusion and suggestions for future work.



## 2. METHODOLOGY

For the systematic review of literature, Methodi Ordinatio (Pagani, Kovaleski and Resende, 2015; 2017) was used, a methodology consisting of 9 steps: (i) Establishing the research intention; (ii) Preliminary research with the keywords in the databases; (iii) Definition of the combination of keywords and databases to be used; (iv) Final search in the databases; (v) Filtering procedures, which include the removal of works outside the scope of the research; (vi) Identification of the impact factor, year of publication and number of citations; (vii) Sorting articles using InOrdinatio; (viii) Locating works in full format; and (ix) Systematic reading and analysis of articles. Methodi Ordinatio provides an overview of the researched theme, resulting in a portfolio with the most significant articles, as it selects considering the impact factor, citations and year of publication. For this study, the Scopus database was used, and four searches were carried out, resulting in four analysis portfolios. The search terms, searched in the title, abstract and keywords, were "Business Ecosystem", "Entrepreneurial Ecosystem", "Knowledge Ecosystem" and "Innovation Ecosystem". The results are shown in Table 1.

Keywords combinations	Gross results	Portfolio final
"Business Ecosystem"	628	132
"Entrepreneurial Ecosystem"	790	230
"Knowledge Ecosystem"	86	17
"Innovation Ecosystem"	864	152
Total number of papers in the final portfólio	2368	531

*Table 1: Results of the search on Scopus  
(Source: Self elaboration)*

The 7<sup>th</sup> step, which applies the InOrdinatio equation, aids to choosing the most relevant articles, based on the three factors: number of citations, impact factor, and the year of publication. The content analysis was done using the software ATLAS.ti, which analyzed all the abstracts of the final portfolio, composed of 531 papers. Finally, a complete reading of the top classified articles in the portfolio was carried out. All the papers with the InOrdinatio equal or lower than 100 were not considered. The following section presents the results and discussions based on the analyzed portfolios.

## 3. RESULTS AND DISCUSSION

This section presents the contents of the portfolio structured in two topics: (3.1) Contextualization of the portfolio, and (3.2) Comparison of ecosystems.

### 3.1. Contextualization of the portfolio

Shows an overview of the analyzed portfolios, Table 2 presents the objective of the most relevant studies in the portfolio.

*Table following on the next page*

	References	Objective(s)
Business Ecosystem	Moore (1993)	Proposes a comparison with natural ecosystems, being the first paper to use the term “business ecosystems”
	Kandiah and Gossain (1998)	Expands and refines the concept presented by Moore (1993)
	Moore (2006)	Describes the reality of business ecosystems to assist members of the judicial system and policymakers in antitrust matters
	Tian et al. (2008)	Proposes a framework that includes an ecosystem modeling component
	Kim, Lee and Han (2010)	Discusses strategies specific to the IT ecosystem.
	Battistella et al. (2013)	Proposes a methodology for analysis, modeling and forecasting of business ecosystem networks
	Basole et al. (2016)	Compares the effectiveness of business ecosystem visualization methods, to contribute visual intelligence tools
	Kapoor and Agarwal (2017)	Analyzes the impact of the interdependence on the business ecosystem regarding the performance of platform-based complementary firms, based on a framework developed by the authors.
	Gomes et al. (2018)	Carries out a systematic review of literature considering the period from 1993 to 2016
	Gupta, Mejia, and Kajikawa, Y. (2019)	Compares IE and Business Ecosystem and Digital Ecosystems, looking for similarities and differences through text mining techniques
	Masucci, Brusoni and Cennamo (2020)	Investigates how open innovation can accelerate technological development in IE
Entrepreneurial Ecosystem	Cohen (2006)	Examines the literature seeking for the applicability of 'sustainable valley', in which the community is the center for entrepreneurial innovations
	Stam (2015)	Reviews the literature on entrepreneurial ecosystem, to present a synthesis and point out gaps
	Spigel (2017)	Present a theoretical model of EE composed of ten attributes and illustrate with a case study in Canada
	Autio et al. (2018)	Analyzes how EE differs from other previous concepts, such as 'clusters', 'innovative milieus' among others
	Spigel and Harrison (2018)	Proposes a conceptual framework on the evolution and transformation of EE
	Roundy and Bayer (2019)	Proposes a theory on resource dependence in the nascent entrepreneurial ecosystem
	Franco-Leal et al. (2020)198	Analyzes the impact that EE actors (university and non-university) have on the creation and consolidation phases of academic spinoffs
Knowledge Ecosystem	Angelidou, Gountaras and Tarani (2012)	Analyzes the advances of urban KE in terms of applications of digital services with the participation of citizens
	Clarysse (2014)	Identifies whether there is a connection between the development of KE and Business Ecosystem through an analysis of a database with information 138 innovative start-ups in the Flanders region
	Scaringella and Radziwon (2018)	Carries out a literature review of the different ecosystems, analyzing the studies from the territorial approach
	Aksenova (2019)	Analyzes the reasons that Building Information Modeling (BIM) applications did not lead to the evolution of the Finnish architecture, engineering and construction (AEC) business ecosystem. The authors analyze the contribution of KE and IE to the early development of BIM
	Attour and Lazaric (2020)	Identifies the relationship between KE and BE, emphasizing the possible transformation of a KE to a platform that incorporates a BE
Innovation Ecosystem	Adner (2006)	Analisar o ambiente de inovação. O autor propôs o termo Innovation Ecosystem. Analyzes the innovation environment. The author proposed the term Innovation Ecosystem.
	Fukuda and Watanabe (2008)	Analyzes the technology policy in Japan and the United States over the past three decades.
	Carayannis and Campbell (2009)	Análise pela perspectiva da Quadruple Helix para EI Analyze from the perspective of Quadruple Helix for EI
	Mercan and Göktas (2011)	Analyzes IE based on three components: cluster development state, university-industry collaboration, and innovative culture Analisar o IE com base em três componentes: estado de desenvolvimento do cluster, a colaboração universidade-indústria e a cultura para inovar
	Oksanen and Hautamäki (2014)	Develops a model for building innovation ecosystems based on a case study.
	Suominen, Seppänen and Dedehayir (2019)	Carries out a systematic literature review and present a conceptual framework on EI.
	Granstrand and Holgersson (2020)	Identify the definitions of EI in the literature and propose a definition that synthesizes the findings Identificar na literatura as definições de IE e propor uma definição que sintetize as encontradas

Table 2: Purpose of the most relevante papers in the portfolio  
(Source: Self elaboration)

### 3.2. Comparison of ecosystems

The term “Business Ecosystem” was proposed by Moore (1993), starting from a parallel with ecosystems in biology. Moore (2006, p.4) states that BE “a network of interdependent niches that in turn are occupied by organizations. These niches can be said to be more or less open, to the degree to which they embrace alternative contributors”. Currently, there are different concepts of BE in the literature. When referring to an ecosystem with companies that develop products, some studies use the Innovation Ecosystem (IE) and the Business Ecosystem (BE) as synonymous. This is due to the similarity of the two models additionally to the lack of a clear definitions (Gupta, Mejia. and Kajikawa, 2019). One difference that can be pointed out is the focus on the customer given in the BE, which has as its main objective to generate value for the customer (Scaringella and Radziwon, 2018). Among the different definitions of IE, Adner (2006, p. 1) defines it as “collaborative arrangements through which firms combine their individual offerings into a coherent, customer-facing solution. Enabled by information technologies that have drastically reduced the costs of coordination, innovation ecosystems have become a core element in the growth strategies of firms in a wide range of industries”. Like the others, the Entrepreneurial Ecosystem has different definitions. Isenberg (2010, p. 3) states that “The entrepreneurship ecosystem consists of a set of individual elements – such as leadership, culture, capital markets, and open-minded customers – that combine in complex ways.” The Knowledge Ecosystem (KE), on its turn, “creates strategies for knowledge generation around knowledge hubs within a certain geographic proximity” (Aksenova, 2019 p. 5). Powell et al. (2010) presents three critical factors for success. The first is the existence of a diversity of types of organizations. The second is the presence of an anchor tenant. Finally, the occurrence of a mechanism called cross-realm transposition, when there is alignment between networks, passing the logic from one model to another within the network, such as spin-off ventures in the academic context reflecting the logic of the model of venture capital. The KE is composed by four constructive elements: the creator (researchers, research institutes and intellectuals); the consumer (company, government, or the legislature of a nation); the environment (it has the role of demanding and evaluating the problems to be solved ); and the distributors (journals, internet etc) (Yang et al., 2009). Table 3 compares the four different ecosystems in terms of the most frequent words in the articles, the participating stakeholders, and the connection networks between them.

Attribute	Business Ecosystem	Entrepreneurial Ecosystem	Knowledge Ecosystem	Innovation Ecosystem
Most frequent words (number of occurrences)	innovation (4972), value (4410), management (4020), new (3859)	new (7326), development (6621), innovation (6412), regional (6135)	innovation (1095), business (894), new (501), management (484)	knowledge (6213), new (5442), development (4924), business (4915)
Stakeholders	Focal firms, suppliers, intermediary, lead producers, competitors, customers	Entrepreneur and entrepreneurial team, university, government, industry, civil society	Researchers, research institutes and intellectuals company, government	Company orchestrator, start-ups, university, government, industry, entrepreneurs, and venture capital
Relation between participants	Weak network connected with key company	Entrepreneur centralized network	Network centralized on research organization, connected to different actors	Dynamic and complex network

*Table 3: Characteristics of ecosystems  
(Source: Self elaboration)*

The software ATLAS.ti built up the frequency analysis of the words for each theme showing the number of occurrences in relation to the total number of words in the articles. Only nouns and adjectives were considered for each portfolio. The occurrence of the words in the search term were not taken into account. For instance, for Business Ecosystem the words "business" and "ecosystem" were not considered, since in all portfolios the search term was obviously the words with the highest occurrence. The words Innovation and New were present as the most frequent words for all portfolios, proving to be a common theme related to Ecosystems. The word Business stood out for BE, IE and KE. As for the analysis of the stakeholders, Business Ecosystem has a company that orchestrates the ecosystem, a keystone company (Peltola et al., 2016; Scaringella and Radziwon, 2018), suppliers (Peltola et al., 2016; Awano and Tsujimoto, 2021), intermediaries (Peltola et al., 2016; Awano and Tsujimoto, 2021), competitors (Peltola et al., 2016; Awano and Tsujimoto, 2021), and customers (Peltola et al., 2016). In this ecosystem, the relationship between organizations is weak, with the network linked to the key company (Scaringella and Radziwon, 2018). Examples of global Business Ecosystems are Intel, Google, Apple, Microsoft, among others. The Innovation Ecosystem has a high-tech company as an orchestrator (Adner 2006), and startups (Yaghmaie and Vanhaverbeke, 2020), universities, government, industries, entrepreneurs, and venture capital (Capetillo et al., 2021) are also included. The Entrepreneurial Ecosystem is centered on the entrepreneur and the entrepreneurial team and has as its central objective the generation of wealth. In this ecosystem it is possible to identify the participation of the quadruple helix, that is, besides the presence of the government, industries and universities, also counts on the participation of civil society. The role of the government is highlighted by implementing actions that support entrepreneurs (Scaringella and Radziwon, 2018). The Knowledge Ecosystem is centered on the university or public research companies and the dense network around them. This ecosystem is an anchor tenant, responsible for connecting players and facilitating the commercialization of research (Scaringella and Radziwon, 2018).

#### 4. CONCLUSION

This paper aimed to understand the definitions of Business, Innovation, Entrepreneur, and Knowledge Ecosystems in an attempt to identify their similarities and differences. In order to reach this purpose, a literature review was carried out, using the methodology Methodi Ordinatio. The papers were selected having as basis the equation  $\text{InOrdinatio} \geq 100$ . All the papers with the  $\text{InOrdinatio} \geq 100$  were considered for the final portfolio and systematic reading. The content analysis revealed that the most frequent words in the papers, where the common theme to all the ecosystems is innovation, were present in the articles of the four portfolios. As for the participation of stakeholders it was noticed an increase trend in the number of actors participating, but the area of study is still facing the lack of studies analyzing the connection between them. The main limitation of this work is that we analyzed only 30 papers. Another limitation is that, considering the topic still needs further studies, as an expansion of the search using other search terms could be done in order to find papers on for the same topic, but using different nomenclatures. A suggestion for future work is to identify the limits of each ecosystem and the proposition of a comparative theoretical model with the scope delimitation, areas of convergence and divergence between the themes.

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## REMOTE WORK AND HYBRID WORK ORGANIZATIONS

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### **ABSTRACT**

*Remote work, especially working from home, has become the most common form of work in the third decade of the 21st century. What started at the beginning of the millennium as an experimental practice in some companies (mainly in the IT industry) has become widespread and unintentional in 2020 and 2021, due to Covid 19 pandemic. It changed some of the most important features of the jobs, such as the communication patterns and the conception of the workplace, leading not only to significant changes in the way work is done, but also to a different psycho-emotional perception of work in the context of changing socialization patterns. The need to transition to a virtual environment forced both companies and employees to try out different ways of working (e.g., managing virtual teams, ensuring infrastructure and access to work resources, managing teams, workspaces, etc.). The paper addresses some of the key factors that influence work performance at the organizational and individual levels. It presents how technological developments and growing awareness of alternative approaches to work organization are changing companies' perceptions of managing their most valuable resource, human potential, and discuss potential failures in telecommuting policies. The goal of this study is to provide insight on the impact of workplace flexibility on work and the broader implications for both companies and employees.*

**Keywords:** *Flexibility, Hybrid Organization, Remote Work, Technology, Work from Home*

### **1. INTRODUCTION**

The importance of work in its organizational and broader socioeconomic perspective is a focus of many studies that address economic, political, environmental, and social challenges. Work is primarily researched in the context of organizations (Kastelan and Sokolic, 2017). Delbridge and Sallaz (2015) define organizations based on four dimensions. Organizations are characterized and described by physical and material spaces that are constructed and experienced through social processes (physical dimension). They are also defined as hierarchical places of power and control (hierarchical dimension). They are seen as sources of new ideas, innovation, and creativity (innovation dimension). Finally, organizations are often defined as collections of actors working together to accomplish work and are therefore embedded in a cultural, economic, social, and political context (human dimension). Organizations are thus spaces and places of work (Delbridge and Sallaz, 2015). However, technological development allows the introduction of new ways of working, which leads to the need to rethink the meaning of certain dimensions and elements of the organization. In particular, the development of information and communication technology (ICT), followed by digitalization, enabled a practice of working at a physical distance from the employer's location, often referred to as telecommuting. This phenomenon encompasses remote work and gradually erases the importance of the physical dimension of the organization. Since all dimensions of the organization are interrelated, changes in one dimension lead to changes in other dimensions of the organization. Although telework has been practiced in some organizations since the beginning of the 21st century, it was initially only an occasional, alternative form of work in addition to the standard workplace and work patterns. With the development of information and communication technology (ICT), it became more present in the organizational context, but still in addition to working in the employer's premises (office, satellite office, etc.).



It was not until the Covid19 pandemic spread that companies began to consider eliminating physical spaces to a greater or lesser extent (even leading to completely virtual organizations without physical spaces for work or interaction). Instead of building traditional organizations, decision makers began to consider and implement hybrid work organizations or even full remote work models. However, the old notion of the importance of the material environment in building and shaping power relations, meanings, and practices (Savage and Warde, 1993) was set aside without analyzing the long-term consequences for human and organizational capital. Because of technology, but also because of changes in the social and economic context, spatial distance, and the at least partial elimination of the traditional workplace, the way work is performed began to change, leading to a re-composition of organizations and the relationships between and within their elements. This paper will discuss the extent to which remote work is likely to become a standard expected by both employees and employers. It will also discuss what factors related to remote work should be examined by companies when deciding which model of remote work to adopt. The paper is intended to help business decision makers broaden their perspective on the impact of remote work on businesses and consider the psychological and relational aspects of work in addition to the economic and short-term outcome-related factors. This article is about broadening the perspective on the future of work, focusing on the effects of remote work on employees and organizations. In the first part, we define the terms remote work, telecommuting, and work-from-home. In the following chapter, we focus on the benefits and barriers of the work-from-home model, both for employees and businesses, and offer a deeper insight that benefits both sides. We continue with a discussion of current trends leading to different models of hybrid work organization. We conclude with an understanding of how they affect the dimensions of organization and the employer-employee relationship in the remote work environment.

## **2. TELEWORK, TELECOMMUTING, REMOTE WORK AND WORK FROM HOME**

In 2019, 5.4% of workers in the EU usually worked from home, and 9% of workers worked from home at least sometimes (EC, 2020). The pandemic turned a gradual trend into an overnight phenomenon. According to the International Labor Organization (ILO, 2021), by the second half of 2020, 17.4% of the global workforce was already working from home. However, not every job/industry is suitable for working from home. It is estimated that only a minority of jobs could be converted to telework (Dingel and Neiman, 2020; OECD, 2021). This finding is consistent with ILO (2021) who estimates that nearly 18% of workers have occupations suitable for home-based work and live in countries that have the infrastructure to enable home-based work. Developing countries and economies with lower growth and with many jobs requiring low-skilled workers have less access to remote work models. Nonetheless, the following facts point to some interesting trends for the future: pandemic regulations are easing; remote work is more common in high-skilled jobs; telework rates were higher during the pandemic among workers in large firms than in small ones; even in Japan, which has not implemented a nationwide lockdown, telework rates increased from 10% to 28% in the first 6 months of 2020 (OECD, 2021). If we extend this logic, it is not surprising that by the end of 2021, 16% of companies worldwide were working 100% remotely (Steward, 2022). When the pandemic began, telecommuting in the form of working from home became a quick alternative to the standard workplace, an attempt to avoid major disruptions that led to the failure of organizations (Choudhury et al., 2020) and consequently economies. This allowed operations to continue as usual while remaining in a pandemic-proof environment and respecting the social distancing instructions for social distancing, but also raised some questions about the impact of remote work and telecommuting on further organizational development in economic, social, and psychological contexts. Many definitions of telecommuting circulated over the past two or three decades.

Allen et al. (2015) state that telecommuting is a work practice that allows individuals to substitute some of their typical work time in the organization to work away from a central workplace, using technology to interact with others as needed to complete work tasks. These individuals are typically members of an organization, as opposed to self-employed/freelancers and/or salaried employees who must work on-site at the customer's location. According to Allen (2015), they are often employees in a larger organization and typically rely heavily on technology to communicate and collaborate with internal and external stakeholders; they work primarily from home/designated location for a period of time, from a few hours to nearly full-time. Telecommuting is often used interchangeably with the terms telework, remote work, distributed work, virtual work, flexible work, flexplace, ICT-mobile work, and distance work, among other terms. While these different terms all represent an alternative to commuting to and from work, they also contain some distinct elements, have different origins, and refer to different situations. While they overlap in that they imply that all or part of the work is performed away from the employer's premises, telework is used at a more subtle level to describe a situation in which any form of ICT replaces travel to work, regardless of the worker's employment status. In terms of employment status, it is more akin to the term remote work than telecommute. The difference between “remote work” and “telecommute” is that the term “remote work” is more general and includes any type of work - both standard and non-standard employment or contract work (ILO, 2020), while “telecommute” is limited to employees and thus excludes self-employed workers. Telework is also closely related to the use of information technology and digital devices (Eurofound, 2020a), and remote work is any work done at a distance. In summary, telecommute focuses on replacing the employer's premises with another workplace for at least part of the working time, resulting in fewer or no trips to work. It also includes ICT and is thus a subset of telework and remote work. A narrower form of remote work is work from home as a form of work that takes place wholly or partly at a specific location - the employee's home. More broadly, it can be performed by both dependent and independent workers and may or may not require the use of digital technology. In this paper, however, we refer to work from home in the narrow sense, as a subset of telecommuting.

### **3. EFFECTS OF WORK FROM HOME ON EMPLOYEES AND ORGANIZATIONS**

Covid19 infection swept the globe in early 2020. Already, between January and March 2020, many countries instructed employers to follow confinement measures and generally close their workplaces and premises. To avoid destroying the entire economy, the viable path for companies was to introduce mandatory full-time work-from-home programs for their employees. Before the pandemic, the technology that allowed employees to work from home already existed and was being implemented in some industries (IT, higher education, etc.). The pandemic triggered a large-scale experiment in forcing workers around the world to work from home, and many discovered the benefits, which typically included less time spent commuting, cost savings, and greater flexibility. Flexibility seems to be a very important factor for both employers and employees. For employees, flexibility means the ability to choose. In the most recent global study on future work arrangement preferences, Reisinger and Fetterer (2021) report that knowledge workers find flexibility more important to them than wage or other benefits (59% of respondents) and would prefer to work for a company that gives them the flexibility to work from anywhere rather than exclusively on the employer's premises (77%). However, flexibility does not exclude occasional working from the office; for 61% of respondents, flexibility meant the ability to work from the office and from home, depending on task requirements. In addition, Reisinger and Fetterer (2021) emphasized that workers in the study were motivated by autonomy, i.e., the ability to decide where, when, and how to do their work as long as they met their goals.

The results of an Australian government survey (2020) also show that most workers prefer to work from home for a period of time, but few of them would choose to work completely remotely, and most also want to work from the office for a period of time. The preferred benefits of working from home are: lower commuting costs, not wasting time in traffic, personal space, and flexibility. From the employers' perspective, flexibility is related to lower fixed costs and higher labor availability. The Eurofound (2020a) report points out that moving the office off the employer's premises (in the case of ICT-enabled mobile work) transfers the cost of Internet connectivity or electricity, and in some cases even technical equipment, from the employer to the employee. Sometimes this extends to health and safety costs as well. Australian government research (2020) is consistent with Eurofound's findings and shows that business preferences are primarily related to the cost of working from home and the actual or perceived level of productivity. While the demand to better align workers' work with business goals and needs has led to the introduction of more flexible work arrangements, one of the biggest concerns of employers is productivity (hours worked, technical and communication issues, etc.) and the perceived inability to control if/when workers are not on-site. Research by the Australian government (2020) indicates that working from home is likely to increase coordination costs, reduce social interactions and knowledge sharing, and decrease collaboration. According to Morikawa's (2020) study of Japanese workers during the Covid19 pandemic, productivity levels when working from home averaged 60% to 70% of office productivity. It appears that different demographic groups and industries have different percentages of productivity. Studies show that employees with higher levels of education, well-paid employees, long-distance commuters, and employees in industries such as IT or certain education sectors tend to keep their productivity levels constant (Morikawa, 2021). This finding is consistent with studies that emphasize that productivity declines more for workers who started to work from home during pandemics (Morikawa, 2020). AbuJarour et al.'s (2021) findings on home-based productivity in higher education relate productivity to work-family conflict and perceived usability of technology (including Internet speed). While potential work-family conflict depends on employees' organizational skills, technology implies access to the same resources that employees use in the traditional workplace (hardware, storage, software, databases, information, support, etc.). However, studies on the impact of home-based work on productivity are inconclusive, as the difficulty of measuring the efficiency and productivity of cognitive, intellectual, or highly skilled work has been one of the most researched topics in recent decades. The physical workplace is an important work-related factor. Adjustments of a remote workplace is related to productivity and effectiveness (Sridhar and Bhattacharya, 2021). Studies report that workers are unable to convert their homes into home offices due to noise, clashes with other people's needs, children, and office equipment (i.e., inadequate desk, internet connection, etc.). As for the equipment of offices and other official workplaces, it is the responsibility of companies to provide it. However, when employees work from home, the obligations are less clear. Employees who choose to work from home, even though they are provided with the necessary equipment in an office, bear a higher responsibility for providing their own equipment. In this regard, a global study by Microsoft (2021) shows that even after a year of working from home, 42% of employees report that they lack office supplies, and 10% do not have a good enough internet connection to get their work done. Aside from not having a work-friendly environment, there are other challenges to overcome, such as being available 24/7 (Eurofound, 2015) or the appropriateness of standard work methods/processes in an online/virtual environment. In addition, it is more difficult to ensure health and safety standards in a remote workplace where employers (and in many cases even labor inspectorates) have limited, if any, ability to intervene (Eurofound, 2020a). Anticipated productivity gains may be related to globalization, worker mobility, and the global availability of human resources.

However, this opportunity comes at a cost. Shaik et al. (2021), in their research on global virtual teams, point to the challenge of employee engagement and other issues in the structure of multicultural teams. They emphasize the critical role that the development of the cultural intelligence plays in the performance of a virtual team, as it is positively related to employee engagement (based on trust). Another factor to consider when discussing productivity is procrastination. Procrastination, defined as the irrational postponement of behaviors (Steel, 2007), is one of the biggest barriers to productivity at work. Procrastination often occurs in the traditional office workplace and can be exacerbated when working from home. Workers may put off completing work-related tasks due to non-work activities such as social media and long breaks (Wang et al., 2021). In addition, the OECD (2021) report shows that perceived productivity at home is strongly correlated with the desire to work at home. In addition, psychological distance and lack of social support are negatively correlated with productivity (Tejero, 2021). In any case, working from home comes with a number of challenges to overcome. A report by Eurofound and the International Labor Office (2017) shows that while the productivity of workers who work from home appears to increase, they are also more affected by overtime, high pressure, a more intense work schedule, lack of boundaries between work and home, and overall higher stress levels. While the use of internet connectivity and mobile devices favors working from home (Messenger and Gschwind, 2016), research points to inefficiencies related to work communication, motivation, and leadership. Effective communication is critical for all organizations. Auten et al. (2020) argued that appropriate communication and efficient information channels in an organization significantly increase feelings of involvement and connection with the organization that people are more inclined to trust the organization and feel valued and appreciated. This, in turn, leads to a positive work experience that results in higher levels of engagement, well-being and lower levels of fatigue. Problems in communication occur in the form of less, lack of, or overloaded verbal and informal communication. Remote workers rely on ICT to communicate with managers, colleagues, and other stakeholders. The typical virtual meeting interferes with people's natural abilities and requires more resources to be invested in attention to words instead. If a person is in the video frame with only their shoulders, hand gestures or other body language cannot be observed. When video quality is low, it is much more difficult to obtain information from a person's nonverbal communication (i.e., facial expressions). In addition, extensive use of video technology in meetings and group chats makes group collaboration less efficient and more siloed (Skalar, 2020). Moreover, long hours spent online and in online meetings lead to the phenomenon known as "zoom fatigue" (physical and emotional exhaustion resulting from heavy screen exposure and limited communication), but also to an increase in passive listening and continuous partial attention, which increases tiredness, headaches (Majumdar et al., 2020), emotional exhaustion, and stress, and has a negative impact on productivity (Rose, 2010). Thus, when online communication is the only way for employees to communicate with each other, studies report lower productivity levels due to less efficient meetings and limited collaboration, concluding that online communication has a time and efficiency cost. Working from home and communicating via ICT limits the scope of interactions within work and results in missed opportunities to build connections and social networks. Particularly in hybrid work organizations, the lack of visibility can affect the formation of informal connections and the reduced availability of information only to a specific group of employees, which in turn can affect their opportunities for promotion and career development (McRae and Kropp, 2022). In addition, working from home can lead to a loss of organizational culture, increase social isolation (Marshall et al., 2007), perceive a lack of organizational support, especially from direct management, and accelerate employee turnover due to weaker employee social and emotional ties and lower identification with an organization (McRae and Kropp, 2022).

Physical and social interactions are related to basic psychological needs for belonging and connectedness, which depend on face-to-face interactions to be met (Vilhelmson and Thulin, 2016; Rasmussen and Corbett, 2008). Higher intensity of home-based work and infrequent physical contact, leading to weaker social ties, are likely to contribute to psychological problems such as isolation and depression (Mann and Holdsworth, 2003), which are negatively correlated with perceived productivity and job satisfaction (Golden, 2009; Virick, 2010; Bentley et al. 2016). Research on remote work during pandemics emphasizes mental health issues related to isolation and loneliness (Toscano and Zappala, 2020; Wang et al., 2021). Researchers and policymakers are looking closely at the impact of remote work on labor factors such as work hours, individual and organizational performance, work-life balance, and occupational safety and health. Benefits to workers include greater control over their work, which can have a positive impact on the quality and quantity of work performed; increased job satisfaction, as it allows individual contributions to organizational performance and success to be placed in the context of daily life (Bloom et al., 2015); and increased meaningfulness of work, leading to positive feelings among workers about their work. In addition, working from home could improve work-life balance through greater work flexibility and job plasticity, which improves employees' ability to manage work-life interactions (Troup and Rose, 2012) and thus increases personal well-being due to greater freedom and choice in managing work obligations. The concept of work-life balance, introduced in the 1980s, refers to the balance between the time workers spend at work and the time they spend at rest or/and with family responsibilities. Reduction in time spent commuting and better time management are related to more time available for family responsibilities. On the other hand, the impact of working from home on workers is not decisive, as the overlap of work and family concerns and the softening of the boundaries between work and personal life can lead to conflicts between work and life activities (Bouziri et al., 2020, Dorenkamp and Suess, 2017). However, working from home can also lead to work-family conflict. Studies by Eurofound (2015, 2020b) on ICT-mobile workers and teleworkers indicate that workers work longer hours, which affects work-life balance because the boundaries between work and personal life become blurred. At this point, some studies showed that the long hours do not necessarily lead to higher productivity due to many factors, such as poor communication and technology issues (The Economist, 2021). AbuJarour et al. (2021) point out that the blurring of boundaries between work and family time can lead to a disturbed work-life balance. In this context, especially when combined with high stress levels, burnout symptoms, and digital exhaustion (i.e., "zoom fatigue"), increased hours can lead to decreased efficiency. In addition, developing, modifying, and implementing alternative methods of completing tasks and delivering the same work content requires time and effort on the part of workers (e.g., managing virtual teams, coaching or teaching in an online environment, etc.). When this is disregarded by employers, it can lead to work frustration, a sense of organizational injustice, and consequently even burnout. Without the traditional on-site workplace, employees may find it difficult to switch off from work. In addition, employers may expect their employees to be more accessible. Working from home can impact stress levels and relationships at home and lead to burnout if legal and reasonable limits on office hours are not respected, including a "right to disconnect" (i.e., from emails, phone calls, and other forms of contact outside of scheduled work hours) (Eurofound, 2020b). A common problem with work-life boundaries is balancing work schedules with other family members. For some parents, work hours become unclear because they need to take care of the household and run errands between their work sessions. In some cases, parents choose to sacrifice their sleep hours and work nights or early mornings, as these are the only quiet hours when they can focus on work and avoid frequent interruptions (Thompson, 2020). Another challenge is data privacy and cybersecurity (related to company data, customers, and employees).

Working from home often requires additional or enhanced data protection on the company side (GDPR, data breaches, stolen information, etc.). Some companies have gone even further and used the reach of new technologies to better control efficiency (e.g., through online hours), which has sparked a debate about moral and ethical principles. The new technologies make it possible to set up new systems to control employees, thus invading their privacy and private lives (including IP protocols, activation of cameras, etc.).

#### **4. TOWARDS A HYBRID WORK MODEL**

This global experiment in work-from-home has resulted in significant learning, demonstrating the feasibility and associated challenges for individuals, businesses, and even regulators. Both employees and employers have gained valuable insights that they can incorporate into their future decisions. Even before the pandemic, the IWG Global Workspace Survey (2019) showed that employers were increasingly adopting flexible work solutions and that productivity in their workplaces had increased due to greater flexibility. Although studies of productivity gains are inconclusive, in part because there may be a difference between a well-prepared strategic decision to move to remote work and the need to work from home overnight because of a pandemic, studies show employers' willingness to continue with remote work practices even after the Covid19 pandemic (Microsoft, 2021). While there are examples of companies working entirely remotely, there is also a variety of remote work models, from using offices exclusively for collaboration and community building, to a "remote-first" mentality, to working remotely a few days per week/month. Surveys and studies also indicate that flexibility is one of the most important factors in deciding whether to accept a job offer (IWG Global Workspace Survey, 2019; Microsoft, 2021). The results of the FlexJobs survey (2021) show that 58% of workers would rather look for another job than work exclusively from the office, and 44% of them confirmed that they know at least one person who has quit or plans to quit because their employer requires them to work from the office. According to the same survey, most of them (65%) plan to continue working full-time remotely after the pandemic. Other surveys show that the attractiveness of full remote work is lower compared to the hybrid model (Eurofound, 2020b). In particular, OECD (2021) reports that while both employers and employees expect greater use of telework after the pandemic, relatively few employees will work full-time remotely in the future. These findings suggest that hybrid work models that existed before the pandemic cannot simply be replaced by a full remote model, nor can we expect a grand return of the traditional full on-site work model. The hybrid model may well be attractive, as it seems to combine the benefits of working in the office - the ability to collaborate, innovate, and interact with colleagues face-to-face - with the flexibility and elimination of commuting associated with working from home. While beneficial to both employees and companies, telecommuting also has some downsides. When implemented properly, it can prevent negative aspects of working from home, such as difficult collaboration and networking, reduced face-to-face interaction, and consequences for long-term career prospects, while providing a better work-life balance for workers. In addition, evidence suggests that workers who work from home take fewer sick days, are more motivated, stay at work longer, and prioritize their freedom over salary increases (saving on travel and other expenses also helps in this regard). As the global trend is related to quality of life, companies need to incorporate the concept of work-life balance into their corporate policies in order to retain their employees. The turnover rate is related to flexibility, work-related autonomy and stress. Therefore, companies need to ensure that processes are well managed, resources needed for work are similar to those in the traditional office, information flow is smooth and transparent, employer and employee values are aligned, and there is a sense of organizational justice. The transition is smoother and productivity losses are lower in the cases where the shift to work-from-home has begun before pandemics.

This speaks to the importance of preparing for the transition and ensuring that all the requirements for working from home are met. The importance of direct supervisors increases as they are the only link between the company and the employee. Their management approach should include objectivity, measured by performance and results rather than hours worked or physical presence. Anecdotal evidence shows that managers do not tend to work remotely themselves and are therefore less sensitive to the situation of remote workers and subjective to workers who spend more time in their offices and build social ties. While the literature on leadership points to the importance of leading by example, the business world still seems to neglect the value of these insights. Studies predict that the hybrid work model may become the most prevalent model of work organization in companies in the future. At the same time, the weaker relationship between employer and employee is expected to lead to higher turnover in the workforce. According to a study by Microsoft (2021), 40% of employees working from home were considering a job change. These trends affect all dimensions of organizations. The physical dimension of the organization includes physical and material spaces used to support technical processes and social interaction. ICT technology enables technical processes to take place outside the traditional office space and the workplace to be relocated from the employer's premises. This can impact productivity and efficiency and requires new mechanisms for establishing authority and control (hierarchical dimension) as well as new work patterns related to value creation (innovation dimension) and knowledge sharing (human dimension). The spatial shift affects the human dimension of the organization. The lack of face-to-face interactions intensifies the challenges of social, psychological, and emotional relationships. Lack of social ties leads to weaker identification with the company, loyalty problems, high turnover rates, motivation and productivity problems, and a loss of corporate culture, necessitating an overhaul of human resources policies. A new approach to attracting and retaining employees will promote changes in the hierarchical dimension of the organization. Not only are employees physically displaced and the situation requires different control mechanisms; they also demand more work-related autonomy and are less integrated into the organization. This shifts the source of power from traditional position-based authority to a more subtle psychological domain of trust, socio-emotional connection, and aligned values. This requires a new generation of empowered managers and leaders who, in turn, are able to increase employee motivation, engagement, and job satisfaction. Changes in the innovation dimension build on changes in the physical and human dimensions of the organization. In situations where employees are less physically and socially connected, there are concerns about the transfer of knowledge and the sharing of ideas that lead to new value creation. This is also related to sustainability. In a globalized world, markets are very dynamic and competitive pressure is high. Innovations are a source of competitive advantage. They are also a source of productivity gains, enabling more investment and leading to more innovation, knowledge capital and new value creation. Remote work offers flexibility for both employees and employers. Employees need more flexibility in organizing their work and personal lives and in achieving work-life balance. Employers want more flexibility in how they use their (human) resources. Currently, the predominant model of remote work is hybrid work organization. However, research on the future of work consistently predicts that remote working, and especially working from home, will become as widespread as the more traditional alternative of working on the employer's premises.

## **5. CONCLUSION**

The Covid19 pandemic has accelerated the already existing trend toward telecommuting. Companies forced to adopt home working without being fully prepared for the transition have intuitively made changes to the workplace, processes, resources (financial, equipment, infrastructure), and people (skills, psychological resilience, social environment).

The current study shows that both employees and employers have found arguments to consider remote work, and especially working from home, as a worthy competitor to traditional on-site work. Although many see remote work as beneficial, especially because it offers more flexibility to both sides, there are some visible and hidden drawbacks related to human, social and organizational factors. However, lessons learned will help individuals and organizations align their preferences and capabilities with the challenges of remote work, such as the need for social contacts and the means to maintain them, with the benefits of more flexible arrangements that allow for a better work-life balance. Research predicts that the trend toward working from home will continue post-pandemic, and to a much greater extent than pre-pandemic, but rarely in a fully remote mode. This draws attention to hybrid models, which offer workers more flexibility while preserving a degree of control and stability for the employer. To maintain stability, companies must rethink the traditional building blocks of four intertwined organizational dimensions: human, hierarchical, physical innovation. The fully remote and hybrid models introduced in the last two years are largely driven by exceptional circumstances such as confinement, constraints, and fear. Nonetheless, hybrid thinking has sparked a new wave of experimentation, with companies implementing different solutions and approaches to find out what works best for both employees and the business. This will most likely become an ongoing process of negotiation, trial and error, and adaptation with the goal of alignment between employer and employee expectations. The research shows that if organizations carefully plan for change and thoroughly implement it, there is the possibility of a positive outcome for all parties involved. Further research could focus on the extent to which organizations, as social entities, are constrained by physical space and materiality or by the way they exercise power and control over their human resources. Another direction should focus on a better understanding of information and communication processes as well as alternations in leading and managing people in online environment.

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## ASSESSING AND IMPROVING THE FINANCIAL LITERACY OF THE POPULATION

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### **ABSTRACT**

*In the era of the development of the digital economy, information society, and increasing globalization processes, the relevance of the study of the socio-economic institution of financial literacy of the population is beyond doubt. However, the rapid emergence of new financial and economic products and services, the expansion of money markets and instruments provides for the need for mobile education of the population and the transition to innovative digital ways and methods of regulation of financial and economic relations. In this regard, the identification and assessment of tasks related to the solution of financial literacy issues are particularly relevant both for the formation of the economy of a single state and for the development of the entire system of global international economic relations. The 21st century is characterized by rapid political and economic changes, crises, including those caused by global climate change, the spread of biological, chemical, and nuclear weapons, outbreaks of infectious diseases. In this period the need to make informed financial decisions increases, the more so as the value of savings decreases. Free access to relevant and reliable information in the field of finance and protection of consumer rights in the financial sector is becoming increasingly important. This is largely influenced by limited material goods, instability, and low predictability of financial markets development. This paper addresses the issue of assessing and improving financial literacy in two countries: Portugal and the Russian Federation. The elaboration of the issue will be carried out by considering the concept and essence of financial literacy in the context of the genesis and transformation of economic culture; Analysis of criteria, methods, and ways of assessing the level of financial literacy of the population; as well as analysis of the conditions of the current situation in the two examined countries.*

**Keywords:** *financial literacy, financial education, National plan for financial education, pandemic, digitalization*

### **1. INTRODUCTION**

With the development of the digital economy, personal financial security becomes one of the most important factors of the economic well-being of the population. In this connection, realizing the importance of increasing financial literacy in the developing information society, a significant number of developed and developing countries of the world adopt national strategies and programs of financial education, improve the regulatory and law enforcement framework for regulating financial relations, and create systems to protect and defend citizens' rights and freedoms on the Internet. Since the main objective of this work is to make a comparative analysis of two countries: the Russian Federation and Portugal, it is worth mentioning what tools are used in these countries to solve issues related to improving financial literacy. For example, on September 25, 2017, the Government of the Russian Federation adopted an order on the adoption of the "Strategy for improving financial literacy in the Russian Federation for 2017 - 2023". Portugal, in turn, adopted the National plan for financial education 2016-2020. The adoption of these measures is due to a number of urgent issues: the growing complexity of financial products offered, the apparent lack of financial knowledge of the population, the rapid changes in the financial markets, the understanding of the need for coordination of all parties to increase financial literacy.

A number of new issues should also be noted. In the period of epidemics and unstable agroclimatic and sanitary-epidemiological situation, the economic culture is a guarantee of the population's security in the context of planning their income and expenditures. The SARS-CoV-2 epidemic, which is the causative agent of COVID-19 pneumonia, which began in December 2019 in Wuhan, China, spread worldwide (according to the international statistical agency Worldometer as of February 5, 2022, more than 375 million people were infected worldwide, over 5.66 million patients died) has provoked an economic crisis, sowing panic and destructive financial behavior not only of citizens but also of large actors of international economic relations. According to Mandell et al. (2009) it should be emphasized that despite the fact that significant results have been achieved by scientists all over the world in the study of the issue of financial literacy of the population, its economic culture, a significant layer of gaps associated with the specifics of individual regions (due to the special mental and cultural specificity) caused by the appearance of new types of financial and economic relations, as well as factors caused by changes in the political, socioeconomic, climatic and sanitary and epidemiological situation remain. Practice shows that scientific hypotheses related to the creation of a model based on unification of international multicultural financial and economic space, and, consequently, the behavior of the population, have mostly failed. Regionalists, against the background of social differentiation and transformation of society in the XXI century, requires continuous scientific observation of significant for society issues (for example, such as the issue of improving the economic culture of society). In this paper is addressed the issue of the increase in the level of financial literacy of the population, which is a necessary condition for the stable, progressive development of the economy and the state as a whole, the approach to solving this issue in Russia and Portugal will be studied, as well as the actual state of affairs will be identified.

## **2. THE CONCEPT AND ESSENCE OF FINANCIAL EDUCATION IN THE CONTEXT OF GENESIS AND THE TRANSFORMATION OF ECONOMIC CULTURE**

In most developed countries of the world, the study of the institution of financial literacy in the context of genesis and transformation of economic culture of issues, which are associated with the assessment of the dynamics of changes in the number of financially literate people is given close attention (Korotina 2016). As the international practice shows, not only there is no unified term ("financial literacy", "financial education", "economic culture", etc.) in science, politics, economics, and the legal field, but also there are no comprehensive ideas about the methodology and process of changing the level of financial literacy and assessment of how effective the activities carried out to develop the economic culture of citizens are. So, only in 2017, the Government of the Russian Federation adopted the order N 2039-r ("Strategy of improvement of financial literacy in the Russian Federation for 2017 - 2023 years") in which the concept of "financial literacy" was enshrined for the first time. Financial literacy now refers to the result of the process of financial education, which is defined as a combination of awareness, knowledge, skills, and behavioral patterns necessary to make successful financial decisions and ultimately to achieve financial well-being. This legal definition differs from several foreign analogs in form, but in content the understanding of the processes associated with the transformation of economic culture is identical. In Portugal, the following definition is widely used. Financial literacy is the degree of mastery of financial skills, that is, knowledge and understanding of the concepts of finance and risk, as well as the ability, motivation, and reliability to apply this knowledge to make decisions in various financial contexts, to improve the quality of human and social life and to enable participation in economic life, according to OCDE (Organização para a Cooperação e Desenvolvimento Económico, 2015). There is a practice of economic and financial literacy around the world.

This topic has become especially relevant during the global financial crisis at the international level coordinated by the Organization for Economic Cooperation and Development (OECD) and the World Bank. Volkova A.D. (2019) emphasizes that the main emphasis of the program was on making changes in curricula and plans in the form of subjects and electives, as well as extensive training and retraining of university teachers. According to Klapper et al. (2012), a powerful engine of financial literacy was created in the U.S., where more than 20 agencies were involved. Thus, to coordinate these agencies a special commission was created, and in 2008 the U.S. President's Advisory Council on Financial Literacy was created. The composition of the council brought together representatives from the private sector, non-profit organizations, academia, government, and other organizations involved in the provision of financial education. In order to create a database of all programs of EU countries for further popularization of the most successful and best practices, a special portal for teachers dealing with education in financial literacy was created to share experiences between countries. Grigoriev (2017) convinced that in Russia, Portugal, or other countries of the European Union, the development of the economy is directly influenced by the improvement of financial literacy of the population. That is why this issue deserves the closest attention of scientists, researchers, politicians, and others. It is worth noting that, under the influence of digitalization, financial literacy has changed from an abstract concept to a tangible definition of having a specific set of sustainable skills that help people independently search for, evaluate, and choose financial services to improve their quality of life. This circumstance demonstrates that users of financial services are becoming more informed, responsible, and selective in their financial decisions. In this regard, the experience of economic education suggests the need to justify such a term as "fundamentals of financial literacy" and "financial education". The Strategy for Improving Financial Literacy in the Russian Federation and the National Plan for Financial Education of Portugal agree that financially literate behavior means a combination of financial attitudes, knowledge, norms, and practical skills necessary for making successful and responsible decisions in the financial market and are the result of targeted activities to improve financial literacy. In turn, "financial education" is the process by which consumers of financial services improve their understanding of financial products, concepts, and risks and, through information, education, develop their skills and raise their awareness of financial risks and opportunities, make informed choices about financial products and services, know where to seek help, and take other effective steps to improve their financial situation (Lusardi et al., 2014). It is appropriate to consider the term "financial education" as synonymous with "financial education," but it is not appropriate to identify them completely. It is envisaged that "financial education" still provides a professional basis and a narrower target audience of future experts and specialists in economics, while "financial education" provides a more superficial format of knowledge, skills, and abilities aimed at the general population as a practical guide.

### **3. CRITERIA, METHODS, AND WAYS OF ASSESSING THE LEVEL OF FINANCIAL LITERACY OF THE POPULATION**

Analyzing the research literature, the following conclusion can be made: at present, several methods and approaches to analyze the financial literacy of the population have formed in the sociological and economic arsenal. In general, the study of the level of financial literacy is based on the study of knowledge, skills, and abilities of subjects of economic relations, called competence (Khekalo et al., 2018). According to Grable et al. (2020) the system of assessment of the level of financial literacy of an average adult involves assessment in such areas as the subject areas of financial literacy, income, and expenses, financial planning and budgeting, personal savings, crediting and investing, risks and financial security, insurance, consumer protection, general knowledge of economics and practical basics of financial arithmetic. The components of the system of assessment of financial literacy of the population are the

population's knowledge, skills, and behavioral motives, as well as personal characteristics and attitudes. The assessment of the competence of financial literacy of the population can be differentiated into basic and advanced levels (Grigoriev, 2017). By the National plan for financial education (Portugal), the following characteristics of behavior and skills are identified as significant evaluation criteria determining the financial literacy of the population: the ability to distinguish regular from irregular sources of income; to distinguish mandatory costs from expenses for additional needs; to assess different needs and desires in terms of financial capabilities; to make financial decisions based on the comparison and analysis of short-term and long-term needs; to keep spontaneous purchases under control, not in. According to one of the most common classifications in the economic literature, the following methods of improving financial literacy are identified: seminars and offline classes with the public; publication of textbooks and other methodological materials; publication of online courses; creation of game simulators; and dissemination of information in the media. A special place in the Plan is occupied by the issues of accelerating digital transformation and, in general, expanding the use of digital technologies for the benefit of improving financial literacy. The strong acceleration of technological innovation in the commercialization of financial services, stimulated by the need to overcome the difficulties caused by the pandemic, has also reinforced the priority long anticipated in initiatives to promote digital financial training for the Portuguese population. From promoting adequate access to digital channels to knowing the characteristics and risks of new products and traditional products with new characteristics, as well as new providers and intermediaries of financial services. In my opinion, it is more difficult to form personal attitudes in the population. However, the experts of the Ministry of Finance of the Russian Federation in the assessment of the level of financial literacy of the population in the framework of competencies highlight the following personal characteristics and attitudes of the subjects of economic relations that are important for the study and that should be developed in the population: to be motivated to improve their financial situation; to be able to control their desires related to financial spending; to be able to distinguish short-term and long-term needs; to realize the difference between basic needs and desires; to take. Quite widespread is the opinion of Russian and Portuguese researchers that an integrated approach and a variety of tools are required in the work related to improving the economic culture of the population. The biggest stake should be placed on children and youth. And in this logic, there is a rational grain, oriented to the future development in this connection, the main emphasis in the state policy of many countries of the world is made on financial education (education) of citizens. The methodology of implementation of this direction provides the necessity of formation of financial culture and responsibility of citizens for their financial decisions; creation, improvement, realization, and popularization of developed educational programs; mass training of teachers, competent in the field of financial literacy and motivation of knowledge of subjects of financial and economic relations.

#### **4. THE FINANCIAL LITERACY POLICIES IN THE RUSSIAN FEDERATION AND IN PORTUGAL**

##### **4.1. The Directions of Financial Literacy State Policy Development in The Russian Federation**

The foundations of the development of the Russian Federation's national policy in the sphere of increasing the economic culture of the population are reflected in the strategy for improving the degree of knowledge of financial literacy in the Russian Federation for 2017 - 2023. Analyzing the program provided by the state, we can conclude that the tasks, methods of effective achievement of goals and solutions in the sphere of municipal government in the sphere of increasing financial literacy of the population are based on the development of the web of financial and economic education, systematic and comprehensive financial education of

the public in the sphere of protection of rights of consumers of financial services. The following directions are identified as the vector of development of the state policy in the sphere of increasing the financial literacy of the population. First, the expansion of financial education, improving the quality of financial education and informing the population by creating an institutional framework and digital information educational environment, creating and improving methodological resources. This educational direction will allow the formation of basic competencies in the field of financial literacy of the population of the country for all ages and target groups (Khekalo, 2018). Secondly, the priority direction becomes informing the population about the issues of financial literacy, in which a special role is played by methods of protection of the rights of consumers of financial services. Thirdly, the resolution of issues and removal of obstacles to the development of mechanisms for cooperation between the state and society, by ensuring coordination of interagency interaction and civilized lobbying. Fourth, psychological and socio-economic preparation of the population for life in old age. This direction is especially relevant in the context of the pension reform in the Russian Federation associated with the increase in the age limits for retirement. Fifth, the direction of interaction at the level of subjects of the Russian Federation and municipalities, which requires not only the creation of regional programs aimed at increasing financial literacy and protecting the rights of consumers of financial services but also the creation of real mechanisms for their implementation. Sixth, the direction of expanding cooperation with financial organizations, civil society, and non-governmental and private organizations, the Government of the Russian Federation envisages that this interaction should be based on the principles of strategic partnership between the state and business. The seventh direction is the area of international cooperation, which is connected with the intensification of work of federal executive authorities, the Central Bank of the Russian Federation, and other interested members and in the area of international cooperation to increase the level of financial literacy of the population, develop financial education and improve information on the protection of rights of consumers of financial services. According to several experts, this area of international cooperation can yield positive results in the context of interaction with the Eurasian Economic Union, the CIS, the Group of Twenty, and the Asia-Pacific Economic Cooperation forum.

#### **4.2. The Directions of Financial Literacy State Policy Development in Portugal**

The National Council of Financial Supervisors (CNSF), comprising Banco de Portugal, Comissão do Mercado de Valores Mobiliários - CMVM (Portuguese Securities Market Commission) and Autoridade de Supervisão de Seguros e Fundos de Pensões - ASF (Insurance and Pension Funds Supervisory Authority), established the remit of the National Plan for Financial Education (the Plan) in 2011. The financial supervisory authorities (Banco de Portugal, the Insurance and Pension Funds Supervisory Authority, and the Securities Market Commission), which launched this project in November 2011, have always taken a medium- to long-term perspective. A five-year analysis is understood as a moment to reassess what has been implemented and how much remains to be done. That's why new National Financial Learning Plans were introduced in 2016 and 2021. Looking back on the road ahead, the supervisors reiterate the importance of maintaining the current governance model of the Plan, which was always envisioned as an aggregator of initiatives by the various partners who intend to join this ambitious national project, respecting its Guiding Principles defined in early 2012. The managers reiterate their commitment to promote and lead the implementation of strategic options that embody the ambitious goals we have set for the coming years, always in collaboration with reference partners with an appropriate target audience. Given the results we have achieved, especially financial schooling and collaboration with the Ministry of Education, the Plan will continue to develop partnerships. As of 10 years ago, the goal of the Plan is to promote the financial education of the Portuguese population.



This goal is recognized as difficult to achieve, but it continues to be pursued with pragmatism based on priority setting, selection of target audiences, use of international best practices, which the Plan follows most rigorously, in particular through its active participation in the OECD International Network on Financial Education (INFE). International Network on Financial Education (INFE) da OCDE. The growing variety of financial products and services and the complexity associated with some of them can make it difficult for consumers to choose. For this reason, the mission of enhancing the financial knowledge of the population and promoting appropriate financial behavior is becoming increasingly relevant, as an important complement to consumer protection measures and, therefore, contributing to financial stability. And in this task, according to the Plan, input from various stakeholders was necessary to develop a project with a strong and sustainable foundation that is both integrative and inclusive.

The current National Plan highlights the following areas of work:

- **Expanding the Vulnerability Environment.**  
The containment and distancing measures are taken during the COVID-19 pandemic had a very significant impact on the economy and, by extension, on household finances. Households with greater vulnerability, because they have lower levels of savings, higher levels of debt, and/or less risk protection, are more likely to be adversely affected by these measures on employment, income, and health. Thus, financial resilience understood as the ability of individuals and households to withstand, mitigate, and recover from negative financial shocks, has become a new Plan priority. It is now recognized that consumer financial vulnerability can take many forms and arise in a variety of circumstances, requiring a multifaceted approach to reducing it, to which financial education makes an important contribution (Oliveira, Bruno, 2020). The growth of digitalization is not accompanied in the same way for the entire population, exposing those with lower digital competence to greater risks, even without counting those who are not digitally literate.
- **Promoting a sustainable economy.**  
Concerns about climate change have increased in the wake of the pandemic, recognizing its impact on quality of life and health outcomes. The importance of the challenges we face requires everyone to work toward promoting a more sustainable economy. The transition to a more sustainable economy depends on making appropriate decisions in household budget management that consider the reuse of goods, promoting a more circular economy.

## 5. CONCLUSION

Summing up the main points of the paper, there is no comprehensive understanding of "financial literacy" in science. The scientific palette of conceptual apparatus is replete with the following approaches: financial literacy is a process; financial literacy is a social phenomenon; financial literacy is a level of education; financial literacy is an element of economic culture, etc. However, system analysis allows us to conclude that in the XXI century "financial literacy" is a socio-economic institution, characterized by a certain range of subjects, types of relations, cause-and-effect relationships, processes, digital tools. By analyzing the criteria, we can identify as significant indicators the subject areas of financial literacy, income and expenses, financial planning and budgeting, personal savings crediting and investing, risks and financial security, insurance, consumer protection, general knowledge of economics, and the basics of financial arithmetic. The standard components of the population's financial literacy assessment system are a) analysis of the population's knowledge and understanding, b) skills and behavior, and d) personal characteristics and attitudes. The assessment of the competence of financial literacy of the population can be differentiated into basic and advanced levels. A systematic analysis of basic criteria and indicators showed that by 2022, people around the world are becoming aware of the importance of improving the level of financial literacy of the population.

In recent years, we can observe positive dynamics in addressing this issue both in Russia and Portugal. We can see that the infrastructure and means of communication that ensure the growth of citizens' education (financial education, financial volunteering, digital tools for controlling income and expenses, etc.) begin to develop intensively. The general course is continuously adjusted to the constantly changing realities. As the most pressing problems that should be identified are digital inequality, lack of means of financial communication, low level of financial education among pensioners (age-specific perception of information and the ability to learn in digital realities). The growth of financial literacy is negatively affected by: a) shadow economy, b) growth of crimes in the financial and economic sphere, c) lack of effective means and methods of protection of population's savings. The low standard of living of the population, lack of savings, economic and political crises can be named objective problems. The priority directions in the sphere of financial literacy of the population include the need to expand the sphere of financial education and inform the population about the issues of financial literacy, the improvement of the financial education system; the solution of tasks to develop mechanisms of interaction between the state and society, through interagency cooperation and civilized lobbying; psychological and socioeconomic preparation of the population for life in old age; the direction to expand interaction with financial.

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## ACADEMIC EXAMPLES IN TIMES OF POST CRISIS SOCIAL ISOLATION

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### ABSTRACT

*This research analyzes the extraordinary influence on the process of social isolation, both of the scientific works of academic Angel Balevski and his poetry. It attempts to draw a parallel between actions and events we witness in the current post crisis isolation. The reflection of his scientific discoveries, as well as the attitude of Angel Balevski through his literary works in times of social, political, cultural and economic transformations in Bulgaria raise particular interest.*

**Keywords:** *Academic examples, Social isolation, Crisis*

### 1. INTRODUCTION

The pandemic crisis that has occurred in the world over the last two years has necessitated serious restrictive measures in almost all spheres of human life. All of this has created particular discomfort in social communication in all its dimensions. Some scientists share the opinion that this creates an opportunity for time to reflect on, understand or need to review past events and processes. The explanation of the current processes is quite complicated and, in some cases, almost impossible and it does not obey the general logical and scientific ideas of such a process. It is obvious that in a period of social isolation are sought and presented to the society similar or close to these events and processes from a recent or more distant past. Direct relations are sometimes impossible, or at least seem impossible, but give rise to consideration of this phenomenon in the development of our modern society.

### 2. SOCIAL DIMENSION OF THE BULGARIAN ACADEMICIAN ANGEL BALEVSKI

“Every human act shall be subject to evaluation from the point of view of morality” (Acad. Angel Balevski). Angel Tonchev Balevski is a Bulgarian engineer, politician and writer. Working mainly in the field of metal technology, he is a long-time chancellor of Vladimir Lenin Higher Mechanical and Electrotechnical Institute (now Technical University) in Sofia, Chairman of the Bulgarian Academy of Sciences and Vice-President of the State Council of the People's Republic of Bulgaria. Angel Balevski was born in 1910 in the town of Troyan. He originates from the same old Ohrid family as Vasil Balevski. In 1929 he graduated from the Third Sofia Men's High School and in 1934 from the German Higher Technical School in Brno, Czechoslovakia. He started his professional activity as an intern at the Engineering Workshop in Sofia. Then he goes through the factories “Chilichena Raka”, “Boris Tashkov”, “Electrometal”, “Avgis”. In 1945 Balevsky became an associate professor at the State Polytechnic, where he established and led the Department of Mechanical Technology and Factory Organization, which after 1953 was transferred to the Technical University of Sofia. In 1947 he became a regular professor. Since 1955 he was a corresponding member, and since 1967 - a full member of the Bulgarian Academy of Sciences. Angel Balevski is the founder of the Bulgarian School of Metal Science and Technology of Metals. He made successful attempts to construct a machine for hot pressing of non-ferrous metals. He developed an innovative method of extracting cast iron from Bulgarian raw materials in a rotating drum furnace. Together with Ivan Dimov he developed a casting method with back pressure, which is a novelty in the world foundry technology and is protected by more than 100 patent documents for inventions in Bulgaria and abroad (Balevski, 2000).

Elected as an honorary and foreign member of academies and scientific societies in a number of countries and international organizations such as:

- Co-Chair of the International Academy of Sciences in Munich (1988);
- Member of the Council, Pugwash Conferences on Science and World Affairs (1971).

We are usually used to accepting people who engage in science, such as closed, little talking and even shy. For them, the importance is in what they will do and create, not in its publicity. And this may be generally accepted, or rather put into our personal perception, without being particularly true and accurate. Knowledge and science have their complexity and great importance both for the individual himself and for society and its development. And assuming that the time of scientific discoveries has long passed its highest frequency, then the contribution of creating and doing something useful to the society in which you live is of particular and essential importance. And isn't it really more important for society and ourselves to preserve and nurture righteous and just valuations with which to measure and weigh otherwise scientific phrazology not always scientific knowledge? To measure it with criteria and indicators that are valid all over the world and that we have to sustain over time? Today this is important not so much for ourselves, but for what is to come and happen. Docho Shipkovinski says of academician Angel Balevski: “A man with an extremely logical and precise constructive thought, a specialist in the field of science, acad. Angel Balevski shows particularly great interests and knowledge in the field of social sciences, literature and art. This rich soul, this happy combination of rational and spiritual not only does not cause a split, but enhances the possibilities for his work as a great scientist in the field of technical sciences” (Balevski, 1985; Shipkovenski, 2022). Many of his works address issues concerning testing and studying the properties of metals and metal alloys, his other works include the influence of mechanical vibrations on the aging processes of metals, third group studies the structural changes in metals when heated, etc. His discovery with prof. Ivan Dimov – the counterpressure casting method that is patented in all developed industrial countries, is truly remarkable. And if the achievements in this field of one of our greatest minds are well known, and at some point – even already recognized, then his public and personal position, which is inevitably related to his engineering knowledge, was described in a very different and impartial way in 1992.

*I look at the world, observe it and speechless I stay,  
all of its marvelous glory is unknown to me  
and I think of course, but I don't dare to stare,  
at life of which I'm amazed, humbled and unaware.*

*For all of us it's clear: if something in the world exists,  
then naturally reasonable, logical and in order it is;  
life spins the wheel and inflates the sails  
of its own free will, makes noise and keeps ahead. (Balevski, 2003)*

Even in this unscientific style of expressing thoughts, the scientist gives his academic message, which he himself calls “unscientific.” There is hardly any doubt about his abilities and qualities, but our close history and his very life are full of periods of denial, recognition and non-recognition, approval or disapproval, and despite the complexity of his time living and working, despite the circumstances that are repeated over and over again in our recent and distant history, and perhaps we are about to experience them in the same way, he insightfully leaves his wisdom, not only in the technical and technological discoveries, but also in his verses and reflections.

And again, it is the wisdom that we find in the written with great force, but also pain “Wise thoughts”:

*In times you start to wonder and learn the world around you  
With slow pace and no grace begin to realize you,  
That you're so small in their eyes and their concern is prime  
You must have felt unsafe at time, having so hard time.*

*In what's called low self-esteem your brain made you believe  
That everyone sees your spiritual poverty  
But you should not give up now and fall  
to criticism and some kind of modesty.*

*All goals you are aspiring have way to be achieved  
And even though you're silly, you can become a chief  
If you follow my advice that is best suited  
in this world so confused, without a noble push (Balevski, 1996)*

### 3. CONCLUSION

There is a science called metrology – science of measurement and methods and means of its application. The subject of metrology is the extraction of information about the properties of objects by measuring with a given accuracy and reliability. The dimensions of human nature are the subject of other sciences, but these are exceptional examples of imitation and standards of behaviour. Academic Angel Balevski, who places great importance on the moral side of the scientist's activities, says that his hands hold endless possibilities, which if not used properly can cause great damage. He points out that “Every human act is subject to evaluation from the point of view of morality. However, when the activity of one person or a group of people has important and sometimes crucial consequences for a society, the assessment must be very strict. The society may exercise control over the actions of an individual – control of the laws that apply to everyone and protect everyone. In this sense, there is no control over human creativity, it cannot and should not exist. There is only the control of generally accepted ethical principles and one's own conscience”. Such measures of development must be determined and if possible, we should create the conditions for them to develop and not just survive in this chaotic reality of ours.

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## CONSUMERS PERCEPTIONS ON FUNCTIONAL FOODS

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### ABSTRACT

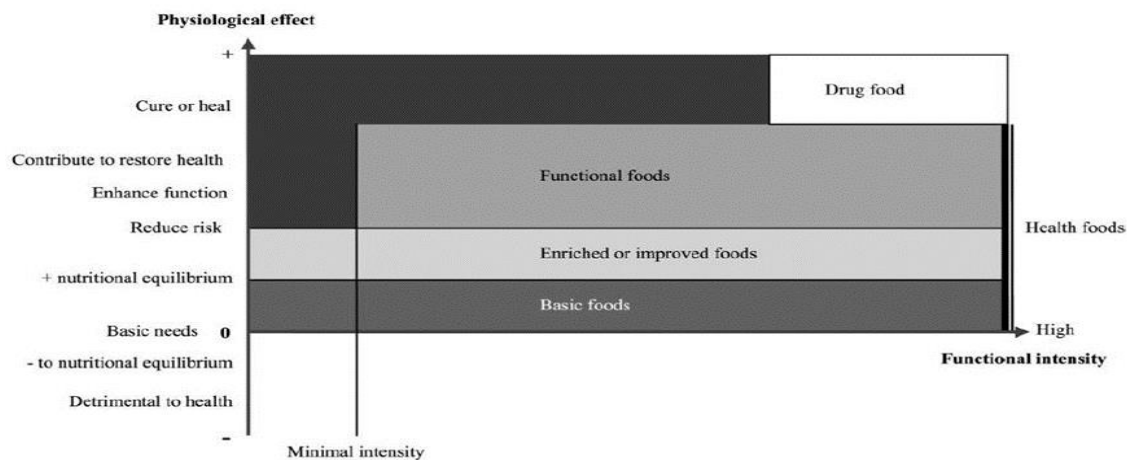
*The functional food market can be regarded as increasingly dynamic since wealthier and more educated consumers are willing to pay more for quality and for healthy food. Nevertheless, this strand of food is challenging for many of the enterprises that operate in this business, as most of consumers keep being unaware of the features of the functional food market. Currently, the focus of nutrition science is on optimizing the power of food, and functional food is increasingly fashionable nowadays, since that enhances quality of life and promotes healthy diets. This paper is based on related studies developed by Küster-Boluda and Vidal-Capilla (2017), and Downes (2008), which have been adapted and applied to the Portuguese population, by the means of a survey, which obtained 639 valid responses. This first approach intends to examine relevant sociometric data within the characterization of the sample obtained. This survey allowed to capture the respondents' sensitivity to functional food, their knowledge, and factors that enhance their consumption versus barriers. The research findings suggest that the surveyed population has still little contact with functional food. Nevertheless, denotes some concerns with health, namely in terms of the aspects of diseases associated with cholesterol, hypertension and triglycerides. Furthermore, the rewards associated with the consumption of functional foods is a valued aspect, as well as active research on information and the issue of taste compromise in face of functional foods. The domains of credibility, trust and security are also important at the level of functional nutrition, presenting an intermediate position. Although the population continues not giving functional foods much importance, it seems they have an active concern and value their health, namely through food. Aspects such as weight control, health and their associated behaviours are highly valued, while the others present median ratings, or are even at the opposite ends of the scales. In terms of barriers to consumption, with the exception of physical activity, the surveyed population does not present a major negative influence concerning these aspects.*

**Keywords:** Functional Food, Consumer's Behaviour, Health, Survey, Portugal

### 1. FUNCTIONAL FOOD: CONTRIBUTIONS TOWARDS A CONCEPTUAL SYSTEMATIZATION

Functional food represents not only a dynamic, but a fast-rising market as well. Nevertheless, this strand of food is challenging for many of the enterprises that operate in this business, as most of consumers keep being unaware of the features of the functional food market. Before discussing this topic, and as developed before in Oliveira and Ribeiro (2019), it is important to mention what is considered as functional food in this paper. Using the Functional Food in Europe (FUFOSE) criteria, as mentioned by Hawkes (2004), food can be considered functional when is possible to demonstrate that affects beneficially “one or more target functions in the body, beyond adequate nutritional effects, in a way that is relevant to either an improved state of health and well-being and / or reduction of risk of disease”. Currently the focus of nutrition science is on optimizing the power of food, and functional food is increasingly fashionable nowadays, since that hence the quality of life and promotes the health.

Doyon and Labrecque (2008) elaborated a classification map of functional foods, considering a two-dimensional analysis, between the physiological effect and the functional intensity.



*Figure 1: Frontiers of the functional food universe  
Doyon and Labrecque (2008)*

In their research, so that he could systematize the concept of functional foods, Doyon and Labrecque (2008) perform a classification of items that most settings feature. The authors emphasize on four main features: health benefits, nature of food, functional level and consumption pattern. It is acceptable as functional food, those who reduce the risk of disease and improve function and contribute to improve health. A functional food will be, according to the International Life Science Institute, some who, when consumed regularly, has a specific beneficial effect on health in addition to its nutritional properties, and this effect must be scientifically proven (Andrez, 2015). Kotilainen et al, (2006); Spence (2006) cited by Siro, Kápolna, Kápolna, and Lugasi (2008), perform a collection and systematization of the types of functional foods and their definitions. They identified four groups of types of functional foods: product fortified (eg. fruit juice with vitamin C); product enriched (eg. margarine plant sterol with prebiotics); altered products (eg. fibres in ice cream); improved products (eg. eggs with omega – 3).

## 2. FUNCTIONAL FOOD MARKET: CHALLENGES AND OPORTUNITIES

Doyon and Labrecque (2008) stated that the worldwide market of functional food grows about 7 to 10% per year, although this is a range for defining the functional food may vary. With regard to the market, Bleiel (2010) highlights three major general premises for the product to be successful:

- There must be a consumer need or problem that requires a solution.
- There must be awareness that the consumer or the people have a problem.
- Consumers must be willing to spend money to solve the problem or satisfy the need that they have identified.

Bleiel (2010) also stresses that the three premises are in effect with regard to functional foods, Monteiro (2015) underlines that the market functional food (and drinks) in 2013 represented sales of about 43,270 million USD. Santeramo et al. (2018) reflects on the growing of the functional food market, by stating that is an activity with risks associated, like a short life cycle of the product; technical difficulties (Bleiel, 2010) and the incipient knowledge of the market



and acceptance of products by consumers (Van Kleef, Van Trijp, & Luning, 2005). These are factors that justify a more detailed study of the functional food's market and factors associated. Gok and Ulu Efe (2019) point out that the increase in the functional food market is mainly due to a series of critical awareness of personal health. Based on Euromonitor data, is the world's largest market for this type of product, followed by the USA, with the European market appearing in third place even less developed than the previous ones. The three major markets make up more than 90% of total sales. Gok and Ulu Efe (2019) point out that there are several behaviours in the European market. Northern countries, with greater tradition in the consumption of functional foods and Mediterranean countries, favouring perishable and fresh products. Considering the data available on the Euromonitor page on functional foods, the authors highlight foods enriched with protein, associated with a healthier lifestyle, as well as the continued focus on products rich in fiber and enriched at the level of dairy products, in specifically yogurts. It is also underlined that the industry focuses its actions on natural segments, and that fortified and functional packaged foods still have growth potential. In the Portuguese case we can refer one or two examples of successful companies that bet on functional and sports nutrition. Prozis, basing its action on online, the turnover continues to grow 60 million euros in 2016; 84 million euros in 2017 and 120 million euros in 2018 (estimate) in a market that worldwide is evaluated in 55 to 60 billion euros (Sousa, A. 2019). Iswari is another Portuguese company that continues to grow substantially. It earned 6.6 million euros in 2017, increase of 52% over the previous year (Barbosa and Nunes, 2019). The changes in socio-demographic context, the innovation in the world of retail, challenges the companies to innovate and find new products. Nevertheless, the behaviour of consumers, climate changes, population growth, rationalization of resources, all together bring new challenges and simultaneously opportunities. Szakály, Kovacs, Peto Huszka and Kiss (2019) highlight several challenges in the functional food market, like development and production of the products, the acceptance of the public, that could lead to neophobia. Studying the Spanish market, Kuster-Boluda and Vidal-Capilla (2017) indicates several steps that the companies should take to be successful, focusing in promoting the benefits and safety of functional foods generating confidence in the consumers; technical specifications of the products to be visible and legible; focused marketing campaigns; transparency to the consumer (eg. packaging and labelling); segment the products to the markets. Carrillo et al. (2013) also states that a good labelling, produces positive correlation with the costumer. Several challenges are inherent to the development of the market of functional food, namely inbound, like academic and regulatory areas, new forms of management, supporting technologies, creation of internal skills, consulting external and innovative sources, brand building and others (Kotilainen et al, 2006). The 2019 Euromonitor report (Shridhar, 2019) - Using Consumer Types to Understand the Path to Purchase, divides consumers into ten major segments, and points out the main causes of consumption for each consumer segment. The main reason for consuming a product, in nine of the ten consumer segments, is the desire to try new products or services, with variations naturally in the different segments. We can conclude that it is extremely important, as functional foods do not have a very strong market penetration. Considering the type of influence or channel most important to the diversity of customers, it appears that the Recommendations of Family and Friends and the Independent Evaluation of Consumers are the most important factors. Naturally, when we replicate these trends in functional nutrition, these results, although they may indicate benefits in terms of word of mouth and close or indirect recommendations, we also have to consider the specific sector in which we are located, with variations in factors occurring. To achieve success on the market as specific as the functional foods, companies should adjust their designs capabilities to emphasize the nutrient and disease prevention capabilities. Adjust the products to the concerns of the consumer's, and their supply (Van Kleef et al., 2005; Siro et al., 2008).

### 3. FUNCTIONAL FOOD IN PORTUGAL: MARKET ANALYSIS

Küster-Boluda and Vidal-Capilla (2017), based their model on a combination of two seminal studies, that of Urala and Lähteenmäki (2007), and that of Downes (2008). The first part of the model reflects the general attitudes towards functional foods on the part of consumers, encompassing the analysis that Urala and Lähteenmäki (2007) carried out. The second part considers the motivators and barriers to achieving a healthy lifestyle encompassed by Downes' (2008) research. The authors, Küster-Boluda and Vidal-Capilla (2017), point out that in their study they aim to achieve three specific objectives: how the consumers' attitude towards functional foods influences their consumption disposition; how healthy lifestyle and health concerns influence these attitudes towards functional foods and which variables motivate or restrict this healthy lifestyle. Considering the study of Küster-Boluda and Vidal-Capilla (2017), and having applied the survey to the Portuguese population, from January until the end of June 2021, through the Google docs tool, having obtained 639 valid responses. Regarding a descriptive analysis of sociometric data, variables that could influence and determine the choice for a healthier and more functional diet were analysed. Thus, the majority of respondents were female (69.5%). Regarding the age group, the vast majority of the surveyed population was concentrated in adults: range 18 to 40 years – 46.2%; 40 to 65 years – 47.3%. In what concerns the members of the household, more than half of the respondents say that it is composed of three elements (28.6%) and four elements (32.9%). Analysing the structure of the household, 84.4% do not have children under the age of six, as well as children under the age of 15, 65.6%; the same trend persists at older ages, where 84.7% of respondents reported that there are no people over 65 in their households. Considering the occupation of the surveyed population, there are three categories that stand out: Employee (52.3%); student (29.1%) and Student Worker (12.2%). The educational level has a greater concentration in the graduated/master's degree (62.4%) followed by the 12th year (31.3%). Most respondents reported living in an urban (45.9%) and suburban (30.8%) area. The distribution by district shows the predominance of the district of Aveiro (37.2%), Lisbon (21%) and Braga (13.3%).

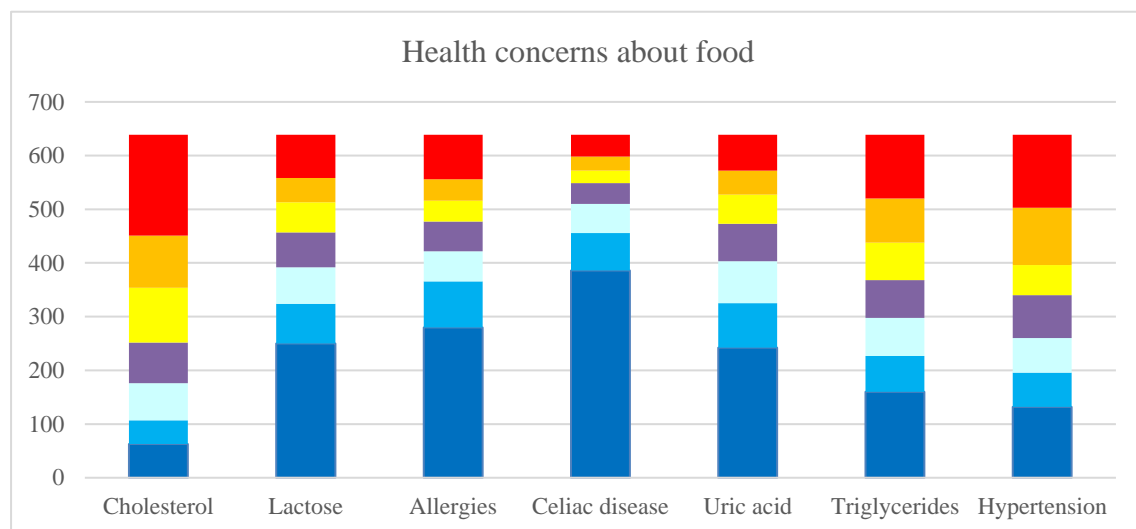


Figure 2: Health concerns about food

Regarding the main concerns with food and the relationship with health and/or the development of diseases this seems to be an unimportant factor in the case of most of the morbidities presented. The exceptions are the importance attributed by respondents to the relationship between food and health, in the case of Cholesterol, Hypertension and Triglycerides. As for the consumption of functional foods, based on a general description, we can see that from the ten foods presented most people have never (or very rarely) had contact with this type of food.

The exceptions are cereals enriched with fibre and minerals, cereal bars with fibre, low-fat cheese and organic bread, which manage to gather some preferences in the intermediate and higher scales of consumption frequency.

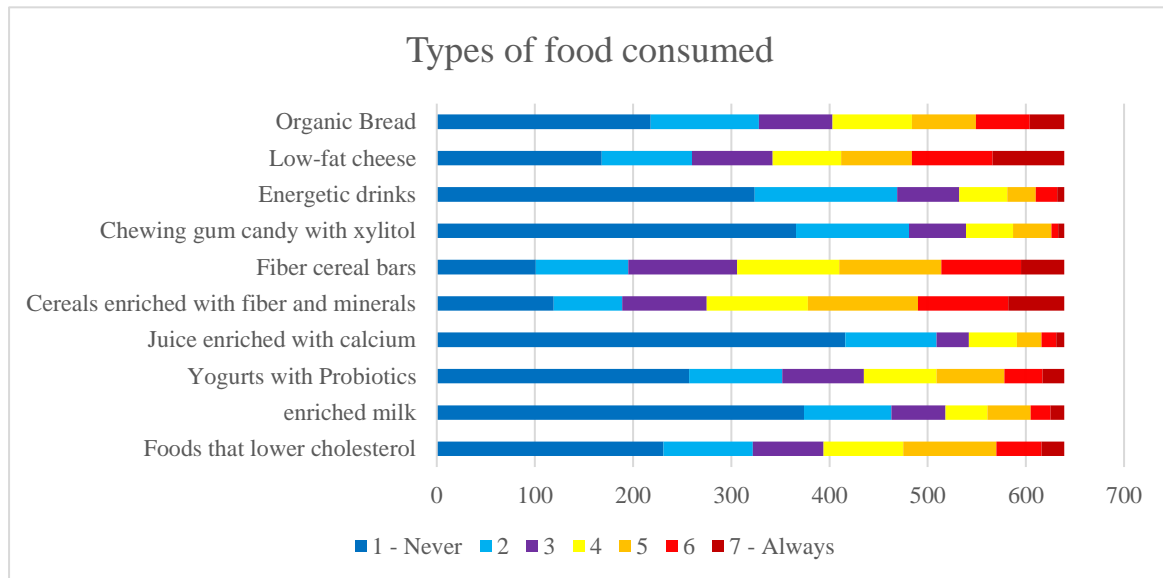


Figure 3: Types of food consumed

As previously referred to, individual attitudes influence the choice of functional foods. Regarding the perceived reward: in health, mood and well-being, it appears that the surveyed population values these aspects in this dimension, especially in what concerns disease prevention. However, the answers that present a greater value in the Likert scale are the commitment of the flavour to the functional product and the active search for information about functional foods.

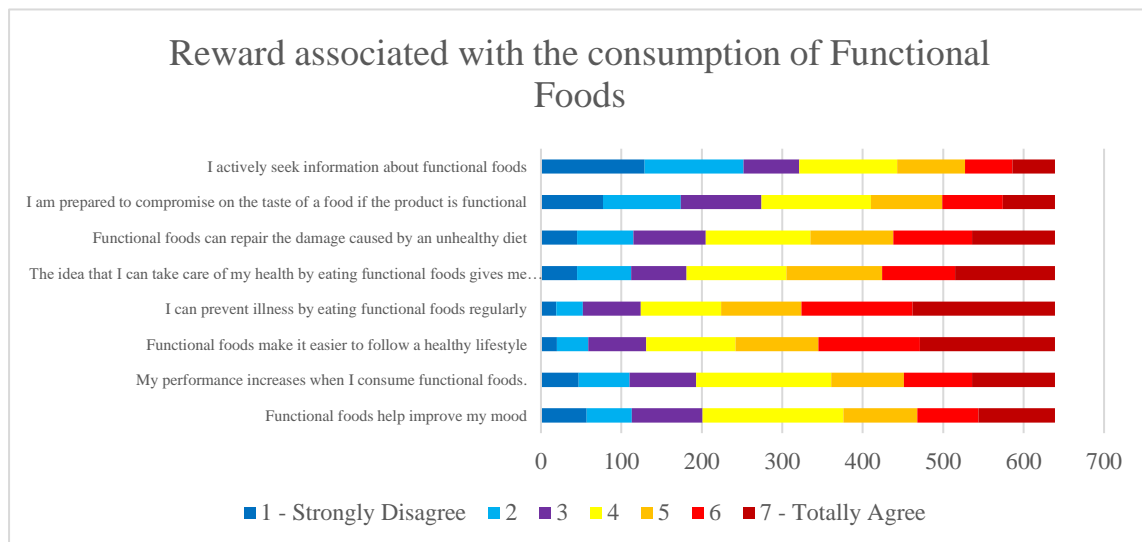


Figure 4: Reward associated with the consumption of Functional Foods

Considering the second dimension, the need for consumption and recognition of maintaining a healthy lifestyle and improving health, it appears that there's a positive attitude towards functional foods and their importance and health development in general. In what concerns the domain of credibility and trust in relation to functional foods there is a more intermediate position in the answers.

If the people inquired recognize benefits in the consumption of functional foods, they also emphasize a relatively neutral position on studies on functional foods, denoting here a relative behavioural idiosyncrasy. The domain of safety in relation to the consumption of functional foods also presents a very intermediate position of the respondents, with no highlight in any item. With respect to the motivations and barriers presented by Downes (2008), and within the first ones, related to a healthy lifestyle, it appears that, with the exception of regular physical activity, most of the surveyed population claims to have an active concern and values their health, namely through food. Considering the second dimension of Downes' motivations (2008), there is already a different distribution of responses. If, in the consumption of functional foods, aspects of weight control, health and their associated behaviours are highly valued, others present median ratings or even at the opposite ends of the scales. Regarding the barriers related to the consumption of functional foods we noticed that the majority of the population does not give much value to this dimension, claiming that they are able to overcome the identified barriers of the consumption of functional foods. Finally, we can say that motivation, support from others and the fact of having many occupations are some of the intermediate classification of items which may reveal some apathy towards functional foods.

#### 4. CONCLUSIONS

One can argue that the functional food market keeps developing. In our sociometric analysis, based on a survey applied to the Portuguese population, it seems that the majority of the households are composed of adults, with a reduced number of young people as well as elderly. The surveyed population has still little contact with functional food, denoting some concern with health, namely in terms of the aspects of diseases associated with cholesterol, hypertension and triglycerides. The rewards associated with the consumption of functional foods is a valued aspect, as well as active research on information and the issue of taste compromise in face of functional foods. The domains of credibility, trust and security are also important at the level of functional nutrition, presenting an intermediate position. Although the population continues not giving functional foods much importance, it seems they have an active concern and value their health, namely through food. Aspects such as weight control, health and their associated behaviours are highly valued, while the others present median ratings, or are even at the opposite ends of the scales. In terms of barriers, with the exception of physical activity, the surveyed population does not present a major negative influence concerning these aspects. We can conclude that, overall, despite the concern about health, the knowledge and consumption of functional foods by the Portuguese population surveyed is still reduced.

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# THE LINEAR ETHNOGRAPHIC PROGRAMMING MODEL AS A TOOL FOR FAMILY AGRICULTURE MANAGEMENT

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## ABSTRACT

*Family farming is a production system aimed the family self-consumption and in some cases with market motivations. Despite the importance of family farming in food security and wellbeing of the rural population, the high levels of poverty regarding family agriculture in the developing countries, make urgent to find suitable tools to manage the systems towards its sustainability. Productive efficiency, environmental protection and social equity stand out particularly. The Ethnographic Linear Programming (ELP) models can be the most adjusted tool since it accommodate all the dimensions of family agriculture management, in a comprehensive way. In this sense, this paper aims to build and validate the ELP model for the family agriculture households, using a family farm from province of Huambo in Angola as case study. The model incorporates aspects of economic, environmental, social, historical, cultural, educational, health and daily life organisation, which are the reflection of the family experiences and their relations with the rural community and the market. The findings show the usefulness of the ELP as a management tool for the observed case of study, which can be largely replicated to other contexts despite the natural and socio-economic constraints and ethnographic specifics.*

**Keywords:** Angola, ELP model, family farming, sustainability

## 1. INTRODUCTION

Family farming is a production system centred on family self-consumption and in some cases with market motivations. This system is characterised mainly by the predominance of family labour and particular forms of succession in relation to land ownership that is generally transmitted from generation to generation (Taveira et al., 2019). In family farming also prevails local knowledge, the ability to adapt and the know-how that is transmitted between generations. Hence, family farming is fundamental to the economy of rural areas (Galdeano-Gomez et al., 2017).

Despite its importance in food production, family farming faces challenges related to the distribution of agricultural products, the lack of support infrastructure and support from public institutions and access to new technologies (Dantas & Ikeda, 2017). Thus, understanding these challenges and the diversity of family farming problems has been a growing research concern. According to Upton (1996), households fall into two distinct functions and areas of neoclassical microeconomic analysis: the consumer function in consumer theory and the producer function in production theory. Over time, some theoretical and methodological models have been developed for understanding the objectives and functions of subsistence or family farming, integrating simultaneously in the analysis, production and consumption decisions and also the market of resources and products (Deus, 2019). That author identifies two types of models that allow the analysis of the agricultural household in different dimensions, based on the neoclassical microeconomic theory of production and those of mathematical programming, with emphasis on ethnographic linear programming (ELP). In light of the above, this study aims to identify if ELP is the appropriate tool to use in the planning and management of family farming, through the model building and validation for a specific household and analysis of its sustainability in the economic and social dimensions. As object of study, a representative farming household from Angola is used, at Huambo province, where farming is considered a way of life and where high levels of poverty exist. The aim is to develop a management tool that can be widely replicated to other contexts, despite natural and socio-economic constraints and ethnographic specifications.

## 2. THEORETICAL FRAMEWORK

The models identified by Deus (2019), namely those based on the neoclassical microeconomic theory of production, fall into two main groups: (i) those that consider the non-existence of a market for family labour; and (ii) those that incorporate the contracting of family labour off the farm. Among these, the Chayanov model (Hammel, 2005), which considers the non-existence of a market for family labour, stands out. This combines the neoclassical model of production theory, which integrates the production functions and the production possibilities frontier, with that of consumer theory and the respective indifference curves (Ellis, 1988). In the second group it is identified the Barnum-Squire model, which incorporates the contracting of off-farm family labour and provides a framework for generating forecasts of household responses to changes in household variables (Barnum-Squire, 1979). Adopting a structure identical to the previous one, Low's model (1986) differs from the previous ones because it addresses agricultural production in the very specific context of the African countries bordering South Africa. It also considers the existence of a wage labour market and wage variation between different labour categories. Concerning mathematical programming models, in particular linear programming models, they were applied to agriculture in the 1950s. They were models of a normative nature, being widely used in agricultural planning to assist farmers in making decisions about the organisation and use of resources and increasing economic results (Heady, 1958). They are also a basic tool to analyse both smallholder farming systems and more complex farming systems, as well as those of subsistence farming, with several crops and several cropping systems and alternative activities. The particular case of ELP, according to Deus *et al.* (2021) allows the integration of various dimensions of the social organisation of households practising subsistence agriculture. In turn, Hildebrand *et al.* (2003) state the advantages of ELP in the simultaneous analysis of agricultural asset production and reproduction activities. For Bernard (1995), the importance of ELP lies in the fact that it combines linear programming with ethnography, which allows for a more complete understanding of the socio-cultural and economic aspects of a household. The ethnographic dimension makes it possible to understand what is done, who does what, when it is done, how it is done and why it is done (Wilsey, Gill & Rios, 2012), considering the multidimensionality of the productive, reproductive and community components of households

and the objectives of maximising their well-being (Deus *et al.*, 2021). The work of Deus (2019) constitutes in fact one of the scarce works found in the literature that used ELP for the analysis of family farming systems in Timor-Leste.

### 3. METHODOLOGY AND MODEL

The ELP model developed is a static and deterministic model, whose structure incorporates the most relevant aspects of family farming systems, in the productive, reproductive and community dimensions. In other words, a model that, having as its objective the maximisation of the well-being of households, allows a choice between different compositions of these activities, based on the available resources and their needs. The modelling considered in the construction of the model is presented in simplified form in Table 1. The objective function maximises the margin obtained by the farmer after removing from the income of activities ( $R_v$  and  $R_p$ ), the fixed costs ( $V_x$ ) of agricultural ( $C_v$ ) and livestock ( $C_p$ ) activities, festivities and human food. This margin serves to support all the expenses not included in the model such as food, health, school, transport, among others. The activities considered are productive, crop ( $X_v$ ) and livestock ( $X_p$ ), family ( $X_h$ ), festive ( $X_f$ ) and community-oriented ( $X_m$ ). Other variables include hired labour ( $N_b$ ), purchase of food ( $N_u$ ), demand for vegetable food for the family ( $Q_g$ ), demand for vegetable food for animals ( $Q_j$ ), demand for vegetable food for festivities ( $Q_s$ ), demand for vegetable food for sale ( $Q_x$ ), demand for animal food for the family ( $Q_t$ ), demand for animal food for sale ( $Q_z$ ) and demand for animal food for festivities ( $Q_e$ ). The availabilities integrate the own factors, land ( $T_a$ ) and labour ( $T_b$ ) and the limits of food purchase ( $L_u$ ). The prices of labour ( $W_b$ ) and food for the family ( $W_u$ ) and the fixed costs ( $W_x$ ) and festivities ( $W_s$ ) are included in the objective function.

Activities	1	2	3	4	5	6					8	9	10	11	Availabilities
	$X_v$	$X_p$	$X_f$	$X_m$	$X_h$	$Q_g   Q_j   Q_s   Q_x$	$Q_t   Q_e   Q_z$	$Z_h$	$L_u$	$X_h$	$N_b$	Naked	$Y_s$	$Y_x$	
<b>Objective function</b> <b>[Max E (Z) (Kwanzas)]</b>	$-C_v + R_v$	$-C_p + R_p$									$-W_b$	$-W_u$	$-W_s$	$-W_x$	
Land (ha)	Aav														$\leq T_a$
Labour (days)	Bbv	Bbp	Bbf	Bbm	Bbh						-1				$\leq T_b$
Crop production (kg)	-Sqv					+1									$\leq 0$
Livestock production (kg)		-Stp					+1								$\leq 0$
Food requirements (Animals, kg)		Flp				-Glj									$\leq 0$
Maximum intake capacity (Animals, kg)		-Ip				Hj									$\leq 0$
Food requirements (Family, kg)						-Gnh	-Gnt			Fnh		-Gnu			$\leq 0$
Maximum intake capacity (Family, kg)					-lh	Hg	Ht					Hu			$\leq 0$
Maximum limit for food purchase (Family, kg)								Ouh	-1 -1.1			+1			$\leq 0$ $\leq 0$
Minimum limit for food purchase (Family, kg)								Ouh	-1 +0.9			-1			$\leq 0$ $\leq 0$
Festive activities													=1		
Fixed Costs (Kwanzas)														=1	

Table 1: Simplified ELP Matrix for family farm analysis  
(Source: Adapted from Deus, 2019)

The parameters concern the land requirements for crop activities (Aav); the input labour coefficients for the crop sector (Bbv), livestock sector (Bbp), festivities (Bbf), family activities (Bbh) and for community activities (Bbm); the costs of crop ( $C_v$ ) and livestock activities ( $C_p$ );



the minimum nutrient requirement coefficients for animals (Flp) and for the family (Fnh); the output coefficients of nutrients from animal food (Glj); of nutrients from plant food for the family (Gng); of nutrients from animal food for the family (Gnt); of output coefficients of nutrients of food purchased for the family (Gnu); of output coefficients of dry matter of vegetable food for the family (Hg) and of food of animal origin for the family (Ht); of output coefficients of dry matter of vegetable food for animals (Hj) and of food purchased for the family (Hu); of coefficients relating to the maximum dry matter intake capacity of animals (Ip) and of the household (Ih); of coefficients relating to food purchase needs (Ouh); and of coefficients relating to food production with plant activities (Sqv) and with animal activities (Stp). The baseline data for the construction of the model were obtained through the adaptation of Deus questionnaire (2019) which, after the pre-test to five respondents and respective correction, was carried out in person, on 19 November 2021, to the selected household. Subsequently, between November 30, 2021 and January 15, 2022, other visits were conducted to supplement the information with the head of household. The questionnaire contained seven sections that include information of the farmer and the family; family, festive and community activities; food; the size of crop and animal crops and their technologies; commercialization; sources of income; and monthly household expenditure. In other words, they reflect the various dimensions of agricultural livelihood systems, namely, agricultural production, integration of product and factor markets, consumption of agricultural and non-agricultural goods, household participation in family, festive and community activities (Deus, 2019).

#### 4. RESULTS AND DISCUSSION

The analysis of the results is composed of two sections. One characterising the household and the conditions and characteristics of the agricultural production system, and the second presenting and discussing the results obtained.

##### 4.1. Characterisation of the household and the agricultural production system

The household resides in Ekunha commune and municipality from Huambo province. The household size is 12 people, being 2 adults (the couple), with an average age of 52 years, and 10 children (6 young people and 4 children), whose ages range between 2 and 30 years and are 4 male (2 young people and 2 children) and 6 female (4 young people and 2 children). The family has a house covered with tiles. The head of the family's income is derived from agricultural activities and from his off-farm activity as a primary school teacher. As for the decision-making process, the various decisions are taken by the man, who is also the head of the family, namely at the level of the agricultural production system, followed by decisions taken jointly by the man and his wife, particularly those of a domestic nature. Food is a decision that falls to the woman of the head of the family. The household's practised agricultural production system is based on the ecological *catena*, which determines the existence of different types of ploughs. These assume the following local designations: *Onaka* (lowland tillage) which is the plot of the marginal zone of rivers and streams, with hydromorphic soils, at certain periods of the year they become waterlogged and lack drainage. In the *Onaka* (5 hectares), the farmer grows corn and beans, in consociation, and potatoes. The *Ombanda* (edge and slope ploughing) is the transition plot between the lowlands and the slope, outside the flooding, but with elevation of the water table. In the *Ombanda* (3 hectares) the farmer grows maize and beans in intercropping, potatoes and onions. The *Epia* (ploughing from above) is made up of the plots on the slopes and in the high areas of the *catena*. The *Elunda* is the cultivation plot in the areas of the old settlements, with a fertility fund increased by human and animal presence. The *Otchumbo* is the plot located in the residential areas, benefiting from the fertilisation of human and animal presence. The farmer grows maize and beans in intercropping in the *Epia* (20 hectares), *Elunda* (2 hectares) and in the *Otchumbo* (2 hectares).

Maize and beans are part of the main diet of the household. Maize is consumed in different forms, fresh (maize cobs), dried and transformed into flour (*pirão* and *quissangua*). Potatoes are produced as a cash crop, as they have been grown mainly for sale on the local market. Animal husbandry is particularly important for the household. Of the animal species, the cattle (20 adults and 6 growing), goats (9 adults and 7 growing), sheep (3 adults and 3 growing) and chickens (9 adults and 9 growing) stand out. Regarding the destinations of the production of cattle and goats, the sale is pointed out as the main one. As for the chickens, according to the farmer, their rearing meets two main objectives - sale and the satisfaction of family needs with festivities, with community activities and diseases. The labour for agricultural activities are intended to meet the tasks of agricultural production, of corn, beans, reindeer potatoes and onions. Among the cultural operations are the preparation of land, sowing/planting, weeding, fertilization, phytosanitary treatment, harvesting and threshing. These activities present the same needs for the different types of farming (*Onaca*, *Épia*, *Ombanda*, *Elunda* and *Otchumbo*). The labour needs for livestock activities are divided between cattle, goats, sheep and chickens. The labour for these activities is essentially from the household, father, mother and children, and hired labour. The main household domestic activities are ensured mainly by the woman and her children, this being divided, together with the support of the children, with the main community activities, which include the commemorative dates of the country, province and municipality and participation in church activities and the enthronement of *sobas*, and household festivities, namely marriage, baptism, birthday, *evamba*, funeral and *alambamento*. The latter, in addition to the need for labour, imply the consumption of plant products (potatoes) and animals (chickens) and have costs, a total of 561 500 kwanzas in the year under review. At the level of production costs, the household had monetary charges for different factors of production, namely for seed, fertilizers, pesticides and traction rental. They amounted to 603 500, 1 778 000 and 971100, for the consociation of corn and beans, potatoes and onions, respectively. Regarding the costs with the animals, the farmer supports 288 000 kwanzas with the rearing of cattle, being more than 95% referring to charges with the veterinarian and medicines. In general, the animals feed all year long on pastures of land belonging to the community. Goats, sheep and chickens do not incur costs. The household possesses a set of resources for agricultural production, namely machete, axe, hoe, plough and cart. The costs with their annual amortization and the appreciation of the opportunity cost of the capital amount to 62.650 kwanzas.

#### 4.2. Results of the ELP model

The cultural occupation of the household in the different typologies of ploughing is dominated by the maize-beans consociation, followed by potatoes and onions. However, it is worth noting that the model for the *Onaka* chose only the maize-beans consociation, discarding potatoes. For the *Ombanda*, the model chose the maize-beans consociation and potato. Onion is not chosen by the model. For the *Epia*, *Elunda* and the *Otchumbo* the model chose maize-beans consociation. As for sales, maize, beans and potato were chosen by the model, while onion was not (Table 2).

*Table following on the next page*

Type of ploughing	Cultures	Area	Cultures	Sale
<i>Onaka</i>	Maize*Beans	5	Maize	26 900
	Potato	0	Beans	39 700
<i>Ombanda</i>	Maize*Beans	3	Potato	24 000
	Potato	3	Onion	0
	Onion	0		
<i>Epia</i>	Maize*Beans	20		
<i>Elunda</i>	Maize*Beans	2		
<i>Otchumbo</i>	Maize*Beans	2		

Table 2: Crops grown and products

(Source: Own elaboration from PLE models outputs)

The main animal species chosen by the model for the household are cows, goats and chickens (Table 3). Sale is the main destination. Among family farmers in the central plateau of Angola, where Huambo is included, animal husbandry is not aimed primarily at self-consumption; rather, sale is its main destination (Katiavala, 2015).

Animal species	Females	Production	Sale
Cows	16	6	6
Goats	6	12	12
Chickens	5	70	70

Table 3: livestock

(Source: Own elaboration from PLE models outputs)

Labour was a very important variable, because it allowed the needs and availabilities identification of the household, depending on the nature of the work. From the model results, family labour predominates, however hired labour was also chosen. Of the labour needs, those related to agriculture, livestock, domestic, festivities and community activities stand out. There are some gender differences, such is shown in Table 4.

Activities		Male	Female	Total
Manpower needs	Agriculture	3153	1372	4525
	Livestock	40,5	1	41,5
	Domestics	0	365	365
	Festivities	19	19	38
	Community	54	53	107
	Total	3267	1810	5077
Manpower availability	Adults	730	730	1460
	Young people	365	730	1095
	Contractor	2172	350	2522
	Total	3267	1810	5077

Table 4: Manpower needs and availabilities

(Source: Own elaboration from PLE models outputs)

Of the household's monetary expenses, those related to plant and animal activities, hired labour and fixed costs stand out. As can be seen in Table 5, the highest financial cost is related to crop activities and the lowest to fixed costs. The main income of the household comes from plant and animal activities. The net margin of the farmer is positive and serves to support all the expenses not included in the model, as mentioned above.

Item	Value in Kwanzas
Costs with vegetable activities	20 850 000
Animal activity costs	288 000
Hired labour costs	2 521 600
Fixed costs	62 500
<b>Costs of agricultural activities</b>	<b>23 722 100</b>
Revenues from vegetable activities	59 253 000
Revenue from animal activities	1 950 000
<b>Revenues from agricultural activities</b>	<b>61 203 000</b>
<b>Net margin on agricultural activities</b>	<b>37 480 900</b>
Festivity costs	561 500
<b>Net margin for the family</b>	<b>36 919 400</b>

Table 5: costs, revenues and margin  
(Source: Own elaboration from PLE models outputs)

## 5. FINAL CONSIDERATIONS

The main objective of the present paper was to build and validate an ELP model for family farm households, using as a case study a family farm in the Huambo province of Angola. The results show the usefulness of the ELP as a management tool for the observed case study, which can be widely replicated for Huambo province, or other contexts, despite natural and socioeconomic constraints and ethnographic specifications. From the characterisation of the household, it is concluded that it is a nuclear type family, composed of 12 people, being the couple and their 10 children. From the age point of view, the average age of the adults is 52 years old and the age of the children range between 2 and 30 years old. Regarding gender, 58% of the household members are female. Although women are the majority, in that household, the adult woman is seen as the housewife, who helps her husband in the field. Women are present in the main income generating activities. However, in the decision-making process, most decisions are taken by the man who is also the head of the household. The findings show that, the house chores are not the responsibility of the man, which is why women end up working more than men, since in addition to domestic activities, they are also present in agricultural activities. The household production system is based on the ecological *catena*, which determines the existence of the different types of ploughs in Huambo. The different types of household ploughs are: the *Onaka* where the farmer cultivates maize and beans and potatoes; the *Ombanda* where the farmer cultivates maize and beans, potatoes and onions; the *Épia*, *Elunda* and the *Otchumbo* where he also grows maize and beans. Note that the *Épia* and *Onaka* are mentioned by the farmer as his main fields. Animal husbandry is particularly important for the household. Among the animal species, cattle, goats, sheep and chickens stand out. Regarding the destinations of the production of cattle and goats, sale is indicated as the main one. As for chickens, according to the farmer, their rearing serves two main purposes: sale and the satisfaction of family needs with festivities, community activities and illness. The results of the ELP models, recommend maize and beans production and discard potatoes for the *Onaka*. For the *Ombanda*, on the other hand, the model suggests maize, beans and potatoes, with onions not advisable. For the *Epia*, *Elunda*, and the *Otchumbo* the model choose maize and beans. Regarding sales, maize, beans and potatoes are chosen as those that would bring the highest financial return to the farmer, while onion in this case is not chosen. The main animal species chosen by the model for the household, are cows, goats and chickens. Of the household monetary expenses, those related to crop activities, animals, hired labour and fixed costs stand out. The main household income comes from vegetable and animal activities. The net margin of the farmer is positive and serves to support all the expenses not included in the model. The PLE model built in this study proved to be appropriate to the reality observed.

However, its replication in other farms is necessary for the model become more representative and adequate to the observed reality and useful for farm management and the development of agricultural and social policies promoting better socio-economic, food and welfare conditions for the population.

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## AN ASSESSMENT OF THE SOCIAL DIMENSION OF SUSTAINABILITY IN AGRIBUSINESS

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### ABSTRACT

*Studies on sustainability of agribusinesses often overlook the social dimension of sustainability. Out of the three traditional pillars of sustainability, the social pillar is clearly the least studied, and gaps in the classification and estimation of its indicators have been identified. On top of that, some social indicators lack scientific validity while others are most commonly limited to capturing intra-company realities. This paper focuses on addressing this gap by identifying the most used sustainability assessment models on the literature in an agribusiness context, selecting the most relevant and common social indicators across the identified models and classifying these social indicators according to the other sustainability scopes (socio-economic, socio-cultural, socio-demographic, socio-environmental, for instance). We carry out a literature review resorting to systematic and integrative methodology, aiming at revealing the social indicators that have already been used or tested in the different models of sustainability assessment, with focus on the agribusiness context. The resulting list of articles is identified according to the systematic criteria enunciated and observing the Prisma protocol. This review is then complemented by a detailed bibliometric analysis of the articles identified, which is deepened with an qualitative content analysis using exploratory techniques that allow the visualization of semantic patterns, which may help the identification of indicators with strong relevance to the social sustainability evaluation. As a result, this paper presents information on indicators used for the assessment of Social Sustainability, which results from several analyses including the semantic cluster analysis of the probed articles. By compiling a comprehensive series of social sustainability indicators, we aim to bring valuable contributions to the future outline of an assessment framework that will incorporate social sustainability dimensions underlying a broader perspective on agribusiness sustainability. Ultimately, this research aims at supporting the sustainable development of the sector from a social perspective.*

**Keywords:** *Agribusiness, Social indicators, Social sustainability, Sustainability assessment*

### 1. INTRODUCTION

Today's companies are been forced to move from the "mere adoption of green practices toward rethinking, redesigning, and redeveloping business practices in a more sustainable way" (Ajmal et al., 2018, p. 327). Given the multitude of existing definitions of sustainability, one of the key emerging research questions is: "under what conditions sustainability happens?" (Santini, Cavicchi, and Casini, 2013, p. 11) and how does agribusiness integrate social aspects into its

management? Since the Rio Earth Summit in 1992 there is an overall consensus on the multidimensionality of sustainable agricultural development goals (Jane Dillon et al., 2016). Agriculture has been able to accommodate the challenge of adhering to evolving principles of sustainability (De Luca et al., 2018) but putting the theoretical concept of sustainable development into practice has proven to be challenging (Meul et al., 2008). A recent review (Chopin et al., 2021) showed that the classical view of sustainability with economic, social and environmental pillars dominates the tools used for sustainability assessments at farm level. This happens alongside intense discussions around the caveats of the “trinomial conception of sustainability”, specifically its failure to capture the interrelations between these and other dimensions (De Luca et al., 2018). Work by Boyer et al. (2016) reveals the complex relationships between the traditional pillars of sustainability, whilst Boström (2012) states these relationships are generally assumed to be compatible and mutually supportive. Integrated assessment tools have emerged as a means to consider trade-offs between and within the different dimensions of sustainability, highlighting the ways they relate to each other despite their inherent differences (Alkan Olsson et al., 2009). The environmental and economic dimensions of sustainability have been “more robustly theorized” (Hovardas, 2021, p.13) than the context-specific, fluid and inherently subjective social dimension (Boyer et al., 2016). Gaviglio et al. (2016) point out to the considerable lack of exhaustive approaches able to evaluate this dimension of sustainability in rural areas. Concerns regarding the social impact of farming practices are as important as environmental impacts (Van Assche et al., 2014; Thompson, 2010, cited by de Olde and Valentinov, 2019). From the stakeholders’ point of view, social issues rank second after environmental issues as highest priority, above economic and governance concerns (Whitehead, 2017). Nonetheless, the social dimension is only considered in 25% of the scientific articles dedicated to sustainability in agricultural production, and the most commonly used indicators in the academic literature do not coincide with the core aspects that practitioners seek to monitor (Rasmussen et al., 2017). There are several possible explanations for the imbalance of studies on the social dimension of sustainability. Social sustainability topics are shaped by the political and socio-economic context, namely regarding healthcare provision and social protection and welfare (Havardi-Burger, Mempel, and Bitsch, 2021), and the heterogeneous nature of social issues in different geographies results in a lack of conceptual clarity and in hesitation around setting normative targets for the social indicators (Gaviglio et al. 2016). This “definitional vagueness” (Ajmal et al., 2018, p. 333) adds to the technical challenge of measuring social aspects and tracking them over time and space using the same tools used for the other two pillars (Bacon et al. 2012; Ajmal et al. 2018). The growing attention to social sustainability has not yet resulted in a standardized framework for evaluation. However, either because the definition of sustainability is strongly focused on people (Janker and Mann 2020) or simply due to increased pressures from stakeholders (Popovic et al. 2017), social sustainability concerns have been gradually integrated into the businesses. This paper aims to bring valuable contributions to the development of an actionable social sustainability assessment framework for agribusiness. By compiling a comprehensive series of social sustainability clusters and synthesizing existing indicators, we seek to facilitate the incorporation of social sustainability dimensions in future assessment tools. Ultimately, this research intends to support the sustainable development of agribusiness from a social perspective, and help decision-makers create the conditions that foster sustainable agribusiness.

## **2. BACKGROUND**

Sustainability assessment tools may be classified in three categories: indicators and indexes, product-related assessment tools (with LCA being the most established method) and integrated assessment methods resulting from combinations of tools (Ness et al., 2006). As far back as 2003, Heller and Keoleian (2003) argued that the life cycle indicators fell short to measure

progress towards long-term food security and system stability, meaning sustainability indicators for the agricultural sector were needed. These should translate an holistic view of the connections between societal well-being, environmental health and personal health, resulting in sustainability indicators that balance these interrelated domains (Desiderio et al., 2022). There are various indicator-based tools for the agricultural sector, the majority of which are aimed at the farm level (Havardi-Burger et al., 2021). Some were developed to reflect the realities of specific sectors such as dairy or permanent crops, while others have a more generic nature, are less exhaustive and more adaptable to different sectors, scales and territories, (Binder, Feola, and Steinberger, 2010; Bonisoli, Galdeano-Gómez, and Piedra-Muñoz, 2018; De Olde et al., 2016). De Olde et al. (2016) have conducted comprehensive reviews of sustainability assessment tools for the agricultural sector and have listed a total of 48. Later, Bonisoli et al. (2018) identified 15 assessment tools covering at least the three traditional pillars. As in other disciplines, the choice of indicators for sustainability assessments in agriculture is not always explained (Meul et al., 2008), despite being subject to extensive discussions in the literature (Havardi-Burger et al., 2021). Kühnen and Hahn (2017) highlights the need for the development of a valid and reliable selection process for the many existing social indicators. To this end Binder et al. (2010) point out three principles for indicator selection: vision/goal orientation, system representation, and data availability. Likewise, Popovic et al. (2017) identifies effective social sustainability indicators as being relevant, clearly defined, reliable, quantifiable and based on accessible data. Bonisoli et al. (2018) add to the discussion by dividing the criteria for indicator selection in two groups: intrinsic requirements (data availability, relevance, analytic validity, flexibility in case of changes and measurability) and usefulness of the indicator.

### 3. METHODS

Guided by the “Preferred Reporting Items for Systematic Reviews and Meta-Analyses” (PRISMA) 2020 protocol (Page et al. 2021), this literature review aimed at capturing the tools and indicators used to assess the social dimension of sustainability in agribusiness. The information sources were the databases of Scopus and Web of Science, which are reputed and widely used research publications and citation databases covering sciences, social sciences and humanities, among other subjects. As neither database is exhaustive and both complement each other, both have been used to ensure broader coverage. The used queries were similar for both databases and built with no date restrictions, covered peer-reviewed journal articles only, were limited to English, Spanish and Portuguese and made use of the same selection of words of interest (and the most similar search string possible) to focus the search on the exact same objectives. The Subject Themes were as overlapping as possible on both databases. As it is not feasible to use the exact same search string on both databases we tried to limit the differences with actions described as follows. Scopus search string: "social" W/2 "sustainab\*" AND ("agra\*" OR "agri\*" OR "agro\*") AND "indicator\*". By selecting all Titles, Key-words and Abstracts of Articles with the word “social” within a distance of two words (either to right or left) of the word “sustainab\*” (in order to cover words like sustainable and sustainability), we aimed to including expressions such as “social sustainability”, “social sustainable”, “social dimension of sustainability” or “sustainability social indicators”, for example. The search string also limited the results to articles which included words starting by agra, agri or agro (like for example agrarian, agriculture, agribusiness or agronomy among many others) in the title, keywords or abstract. The query command was completed with the rule of also having to identify the words “indicator” or “indicators”. The search was restricted to the following subjects: Environmental Science, Agricultural and Biological Sciences, Social Sciences, Energy, Economics, Econometrics and Finance, Business, Management and Accounting, Engineering, Decision Sciences, Veterinary, Multidisciplinary.



This search query, ran on the 15<sup>th</sup> of January, identified 155 articles. Web of Science search string: "social" near/2 "sustainab\*" AND (agra\* or agri\* or agro\*) AND indicator\*. This query was limited to Articles and applied on their Topics (Title, Abstract, Author keywords, and Keywords Plus). To mimic the constraints used in Scopus, a proximity operator between words was also applied: the command “NEAR” to which we append the number of words to look for on the vicinity of the anchor words (near/2). This way we replicate the scope of search in both databases looking for expressions rather than for isolated words. An effort was made to select subjects/themes of scientific investigation analogue to the ones used in Scopus, so Architecture, Business Finance, Chemistry Analytical, Computer Science Artificial Intelligence, Engineering Industrial, Engineering Manufacturing, History Philosophy Of Science, Law, Materials Science Multidisciplinary, Food Science Technology, Energy Fuels, Computer Science Interdisciplinary Applications, Engineering Civil and Geography Physical were excluded. This search query was also applied on January 15 and resulted in 142 articles. Alongside the systematic selection of articles via databases an integrative selection of documents via other methods was made. The subsequent integration of this new set of scientific articles aims to offset the lack of semantic standardization on the research topic. The goal was to enhance the range of articles for analysis, by identifying and incorporating documents that add to the topic despite not fitting the query restrictions used for the systematic selection. This integrative effort followed clear criteria for a subsequent judgemental selection: cross-references from the articles systematically selected, evaluation of Mendeley suggestions on the “social sustainability indicators” theme (suggestions based on Mendeley’s artificial intelligence logarithms of search, usage and storage history), Oriented Web Search of “social sustainability indicators” diagrams, charts, graphics, maps, tables or drawings with a further stage of fine search mining to reach associated documents to those findings. The documents thus identified as relevant for the investigation were extracted for comprehensive appraisal and critical reading and added to the dataset as a separate selection. The systematic selection process is presented in the diagram below (Figure 1). The initial group of articles identified and extracted from both databases screened in a 3-step process, identified 206 articles on a first stage. These were then systematically cleaned of all non-usable documents resulting in a final selection of 103 articles of interest. Many of the documents were excluded, due to being duplicated or either by non-compliance with the research object or by denied access to download (‘not retrieved’). In addition to this initial group of documents, fifty-five (55) other articles were identified using an integrative selection process as being of relevance to the scope of the research. This integrative selection of articles was added to the systematic selection previously obtained, resulting in a total of 158 articles subject to analysis (with the exception of the bibliometric metanalysis process which could only be performed on the systematic selection of articles due to Bibliometrix<sup>©</sup> software constraints).

*Figure following on the next page*

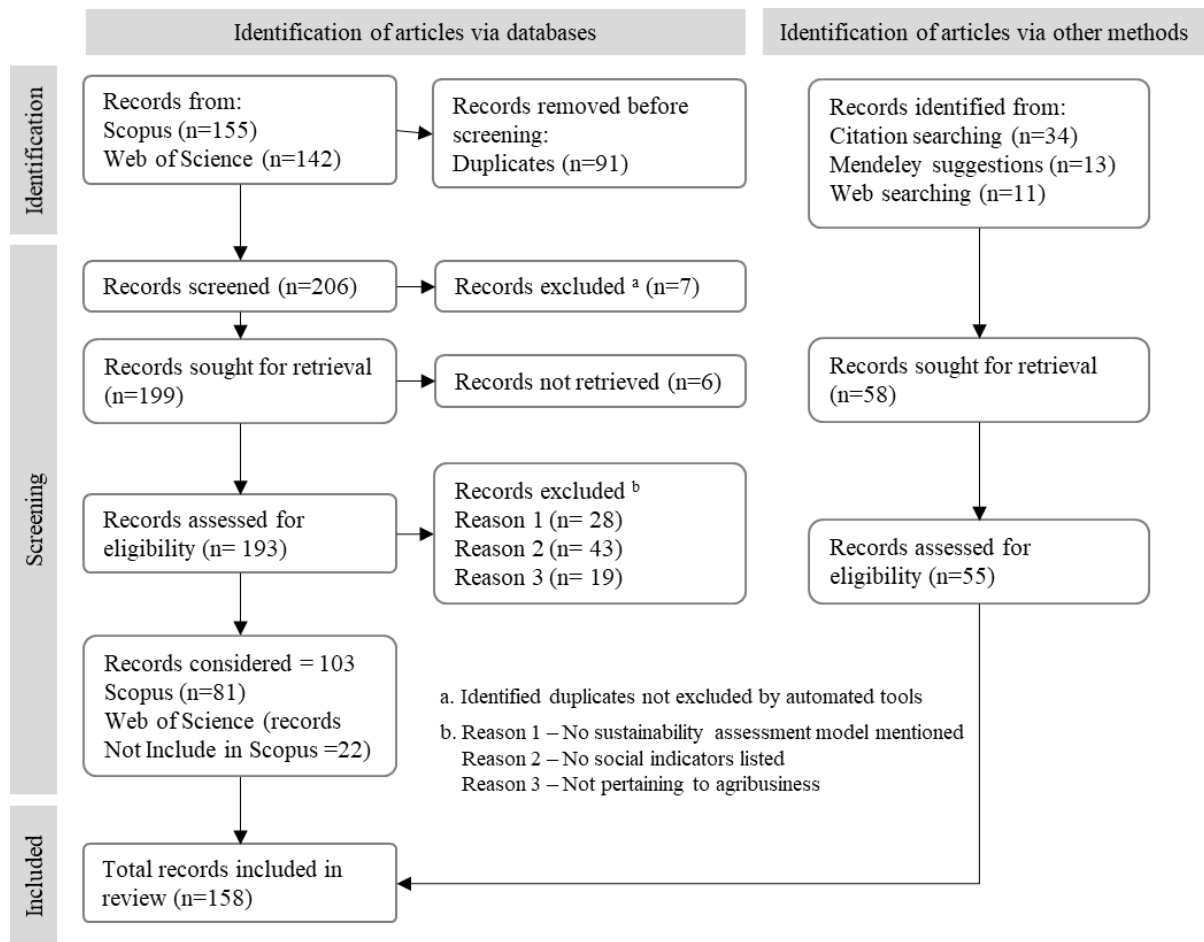


Figure 1: Flow diagram for the systematic review following PRISMA 2020 protocol

The quantitative analysis was conducted using Rx64 4.1.2 and RStudio Version 2 software and the Bibliometrix 3.1 application. This open-source tool for quantitative research was employed to analyse all articles that resulted from the systematic selection described. The qualitative analysis of all articles selected was performed using NVIVO Version Release 1.4.1 (815) software and its analysis functionalities.

## 4. RESULTS

### 4.1. Quantitative analysis

This analysis included 103 articles from 480 authors published in 64 different sources. The publications within this dataset have been relatively scarce until 2008 and have shown an exponential trend ever since. The growth in scientific production was naturally accompanied by the diversification of the sources of publication, and both facts reflect the growing awareness of the multidisciplinary nature of sustainability science. The dataset is dominated by single-country publications, which can be explained by the territorial specificity of a large number of articles. An analysis of the authors' keywords evolution suggests that "social indicators" is the most recent and active trend among the topics pertaining to social sustainability in agriculture. The overall increase in publications since 2012 may have been prompted by the Rio+20 Summit held that year, encouraging efforts to promote social participation in the construction and implementation of sustainability commitments – thus also promoting scientific research on Social Sustainability, its indicators and frameworks for its assessment. This exponential growth is clearly identified when quantitatively analysing the dynamics of words present in the Abstracts of the systematic selected articles to support the investigation (Figure 2). Overall the expression that presents the most expressive growth is 'Social Sustainability'.

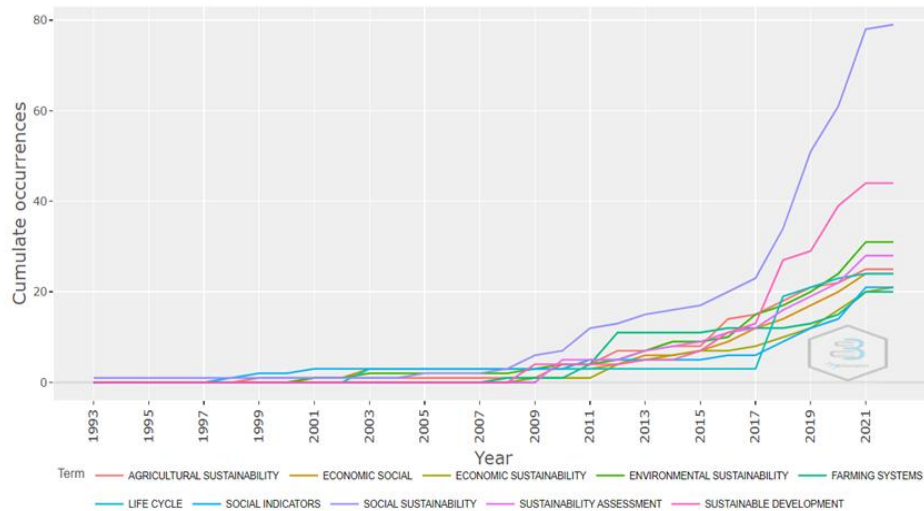


Figure 2: Word Growth representation for the word presence on abstracts of the systematic review article selection.

(Source: Biliometrix analysis output)

#### 4.2. Qualitative analysis

After introducing all the bibliographical research texts (158 articles from systematic and integrative selection) an initial analysis of the most frequent words within the entire text of the articles showed a word cloud consistent with our search criteria, hence supporting the accuracy and the validity of the selection for the proposed research. Furthermore, the subsequent qualitative analysis on the dataset, including proximity analysis of words and expressions of interest, revealed the existence of close relationship in between words and expressions of major importance for the investigation. This type of analysis evaluated the co-existence of a set of words in the same paragraph, meaning a high likelihood of a syntactic link. As a result, the proximity analysis identified that the aggregation of the word “Social” and “Sustainability” is very strong and has grown significantly in recent years. As for the association of the word “Social” with “Indicators” or “Assessment” there is also a growing trend. The findings illustrated in Figure 3 offer reassurance on the adequacy of the article selection for further work pertaining to the identification of the themes, sub-themes and indicators more frequently used on the assessment of social sustainability.

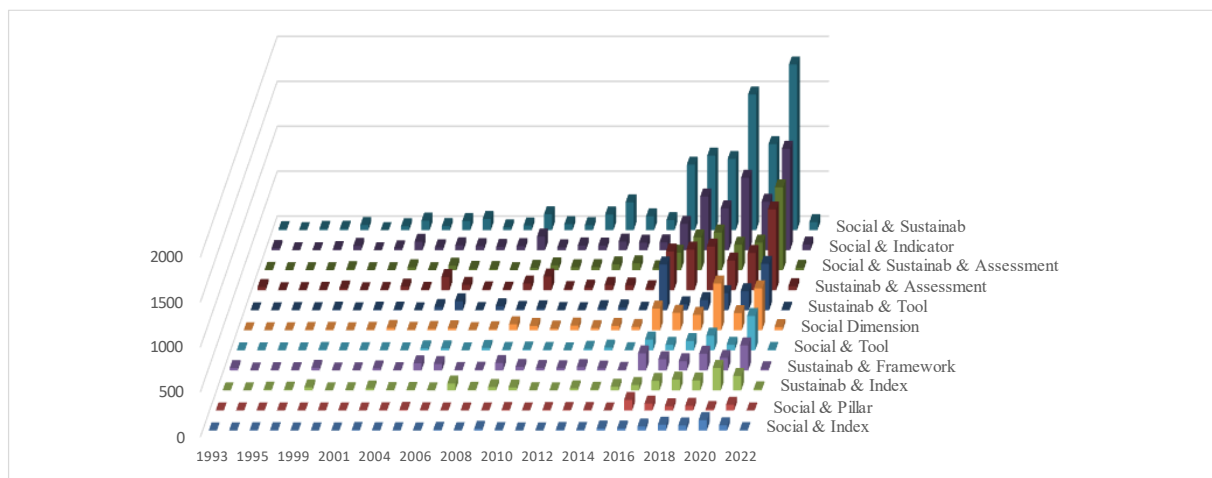


Figure 3: Trend in word proximity – Word proximity in same paragraph analysis.

(Source: adapted from NVIVO output)

### 4.3. Social Sustainability Indicator screening

Following the quantitative and qualitative analysis using automated tools, the 158 articles were subject to a comprehensive screening process in order to identify those papers where social sustainability indicators were discussed, listed or tested in empirical settings. 103 articles were selected and all the social sustainability indicators identified were listed. These were then categorised in 8 thematic clusters - Community Relations, Participation and Engagement, Demographic Dynamics, Education and Training, Employment and Labour Conditions, Equity and Social Justice, Health and Safety, Living Conditions and Wellbeing, Productivity and Food Security - and later classified as ‘Traditional’ or ‘Emerging’ according to Colantonio (2007) proposed criteria. This process allowed us to build a preliminary database of the most frequently explored social indicators in the agribusiness context per year of publication, consisting of 1249 individual indicators.

### 4.4. Themes and indicators in the selected literature

In this preliminary assessment of the themes and indicators in the selected literature we identified a lack of standardisation of definitions, scopes and metrics to assess social sustainability, among intense discussion on the directions for future work. Our literature review suggests that it is no longer reasonable to state that the social dimension of sustainability is overlooked by researchers and practitioners. Recent years have seen a wealth of research on the topic, particularly since the Rio+20 summit held in 2012. Our analysis also shows there is an evolving library of social indicators, covering an increasingly wider range of social themes. As noted by Colantonio (2007), there is a gradual shift from traditional themes of social sustainability such as employment, social justice or poverty reduction to more subjective themes such civic participation, access, QoL and wellbeing, reflecting the efforts by researchers, planners, and practitioners alike to “address and integrate social aspects of sustainability” (Boström 2012). By means of an individual interpretation of the social sustainability indicators mentioned in the selected articles - that resulted in their clustering in 8 thematic groups - we have been able to illustrate the trends in scientific discussion. Based on the findings from the bibliometric analysis, we have conducted our assessment using two time periods: ‘up to 2012’ and ‘from 2013’. Figure 4 shows the growth dynamics of each of the defined clusters between the two periods. The growing concerns with individual and societal well-being, namely work-related satisfaction and civic participation, are very noticeable.

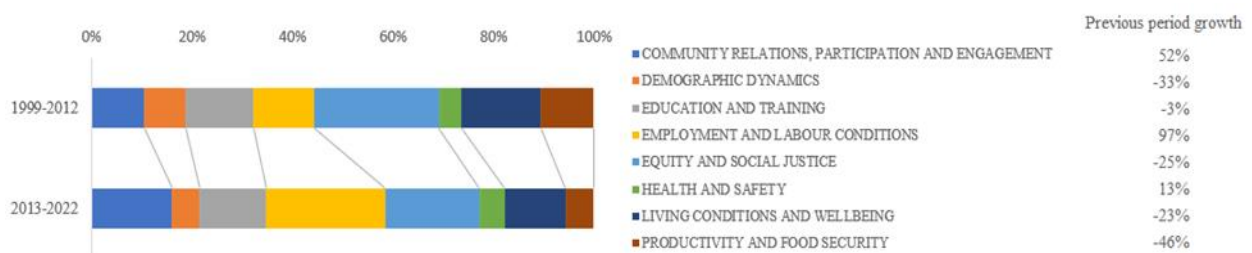


Figure 4: Evolution of the relative weight of each Cluster of Social Indicators, pre and post 2012.

By further classifying each indicator as ‘traditional’ or ‘emerging’ we can observe that even more classical themes such as Equity and Social Justice present a relevant proportion of indicators covering emerging topics. As for Community Relations/Participation/Engagement, Health and Safety and Demographic Dynamics indicators, these reflect current concerns requiring monitoring and evaluation that are not always covered in older sustainability assessment models. On the other hand, Productivity and Food Security are solidly anchored in broadly used traditional indicators.

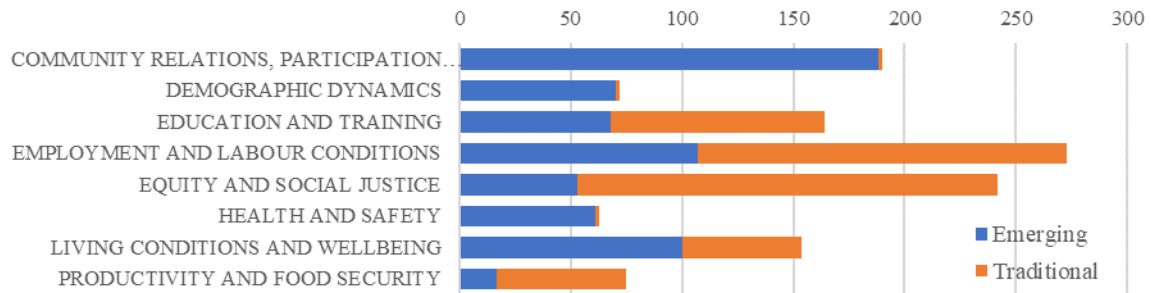


Figure 5: Number of Social Indicators identified per Cluster and classified by the authors as Emerging or Traditional (according to Colantonio, 2007 classification criteria)

## 5. CONCLUSIONS

In this work we performed a methodic literature review and obtained an overview of the social sustainability indicators being used the most in social sustainability assessment research. These initial results show an abundance of indicators accrued by the individual nuances of definitions and scopes used by authors or required and by the specific agribusiness context in which they are applied. At this very early stage of our research our findings suggest that social sustainability indicators are undergoing a major growing effect, growing in interest, growing in necessity, and growing in novelty. We believe this work may guide further explorations more systematically.

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## CAUSES AND EFFECTS OF TAX EVASION IN GHANA

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### ABSTRACT

*The incidence of tax evasion/avoidance has become one of the major challenges affecting revenue generation in many countries, especially in developing and emerging economies like Ghana. This study aims to examine the causes and effects of tax evasion and tax avoidance in the Sekondi-Takoradi Metropolitan Assembly of the Western Region of The Republic of Ghana. The main objectives are: (i) analyse the causes of tax evasion/avoidance; (ii) analyse the effects of tax evasion/avoidance, according to the point of view of small business owners. The data was collected using a structured questionnaire. The final sample size is based on 97 taxable persons and businesses. According to our findings, the retail sector is more prone to tax evasion; females behave differently from males. In relation to cause and effects, education and marital status are the main differences, as stated by the respondents' opinion.*

**Keywords:** *Ghana, tax evasion, tax rate, income, education*

### 1. INTRODUCTION

The development of every economy in the modern world largely depends on tax revenues from taxable entities and individuals. However, tax evasion has existed for over two thousand five hundred years ago. At that time Plato on writing about tax evasion mentioned that Ducal palace of Venice had a hole through which it received information on people who evaded taxes. Fjeldstad (2006) posited that during the third century BC in India, the state craft arthasastra advised the kings of Mauryan to take good care of the state revenues otherwise be misappropriated by the people for self gains. The Global Financial Integrity (GFI) estimated that African countries lost US\$854 billion in cumulative capital flight by way of tax evasion and avoidance between 1970 – 2008 (Germany Federal Ministry for Economic Cooperation and Development, 2010). Ghana economy is also strongly affected by tax evasion. Therefore, the aim of this study is to analyse the causes and the effects of tax evasion in the point of view of small businesses owners. Based on the tax evasion literature we have identified the main factors that might causes tax evasion. In terms of methodology, we prepared a questionnaire to obtain the data needed; next using appropriate statistics methods we achieved the results. The results discussion allowed us to reach the conclusions about the causes and the effects of Ghana tax evasion issues. This work is structured as follows: we present a brief literature review after this introduction. Next, we explain the methodology used in the study, mainly, the sample and the methods used. Finally, after the discussion of the results we present the main findings.



## 2. LITERATURE REVIEW

The 21<sup>st</sup> Century truly poses a higher tax evasion challenge and has negatively affected developing countries like Ghana. This does not only result in a deficit in revenue targets but also a stale in economic development. A similar study in Tanzania on tax evasion shows a rampant adverse effect on almost all sectors of the Tanzanian economy (Wadhawan, 1998). Wadhawan's study is corroborated by a ESRF (2010) study which estimates a 35 – 55 percent range of tax evasion on total revenue in the informal sector. As entities and individuals consciously decide to avoid or evade tax in order to reduce their tax obligations an attempt to analyse the impact of “tax evasion” is prudent if a state or government wants to improve its tax revenues for development. According to a study by Manamba (2013) the incidence of tax evasion has become rampant as a result of low salaries to revenue collection agents/officials, lack of incentives, high tax rate schedule, among others. Tax is a compulsory collection of money by a public authority for public purposes (Soyode and Kajola, 2006). According to Altus Directory, (2006 – 2010) the reasons for taxation can be classified as follows: *revenue* - Government's revenues largely depend on the taxpayer's contribution which is used in the provision of quality educational systems, social amenities such as hospitals, clinics as well as infrastructure like roads among others.

- *redistribution* - This purpose of taxation aims at an effective and appropriate distribution of economic wealth among all sections of walk-of-life, both the affluent and not so well off in society. Even though, very debatable and arguable, Redistribution is a common practice among democratic economies but varies in ways and proportion of application among countries.
- *reprising* - The reason for this taxation aims at addressing certain externalities suffered by society due to some actions of industries. For instance if we look at the sources of the threats to society through global warming, it is clear that it is as a result of the emission of toxic carbons from industries, among others. Various activists and governments, therefore, suggest the imposition of such tax on industries. As mentioned in the introduction of this study about tax evasion, Jackson and Milliron (1986) identified fourteen (14) vital determinants of tax evasion. They included: complexity, fairness, revenue initiated contact, compliant peers and tax morale or ethics (i.e. ‘behavioural’ determinants), gender, age, education and occupation status (i.e. ‘demographic’ determinants) and income level, income source, marginal tax rates, sanctions and probability of detection (i.e. ‘economic’ determinant). Richardson (2006) also identified other significant tax evasion determinants as tax morale, income source, education and fairness to buttress earlier studies by Jackson and Milliron. The most pertinent question of why people evade and avoid tax could be ‘attempted’ by taking a cursory look into the major determinants of tax evasion as identified by Jackson and Milliron (1986) and Richardson (2006). Ten (10) key variables of Jackson and Milliron's (1986) findings need more emphasis in future studies. The study will dwell largely on the fourteen (14) vital determinants of tax evasion by Jackson and Milliron (1986).

For instance, Stamatopoulos, et al., (2015) argued that people become more conscious and responsible in honouring their tax obligations when they are educated about the usefulness of tax as against the uneducated. The study outcome corroborated Ibadin and Eiya's study in Nigeria which showed a significant relationship (at 5% level) between education level and tax compliance, that the higher one's education the more compliant one becomes (Ibadin and Eiya, 2013). Oremadu and Ndulue (2011) argued in their study on the self-employed in Nigeria found to be evading tax that low education levels affect tax payment. Kriz, et al., (2007) also confirmed this relationship in the Estonian case.

On tax rate, the Federal Germany Ministry for Economic Cooperation and Development (2010) study on tax evasion and avoidance in developing countries confirmed that when tax rates are high disposable income reduces therefore inducing people to evade tax. A study in the Temeke municipality in Tanzania on tax evasion by Stephen (2014) resulted in 34% (the highest) respondents tracing the cause to high tax rates. The OECD (2013) report paints a positive picture about how education transforms people to put aside their personal interest and look at the bigger picture by paying taxes to contribute their quota towards revenue mobilization for development by the government. Rutasitara, et al., (2010) also underscored the importance of tax education in their study. They argue that tax education does not only make people understand why they pay tax, but it also gives them the mathematical understanding of their tax rates and the need to pay tax frequently and promptly. Other studies have been done in the area of high tax rates and tax evasion and avoidance and the results have largely been that where the tax rates are high the probability of tax evasion and tax avoidance is also very high. The phenomenon is quite common in developing economies.

### 3. DATA AND METHODS

As previously mentioned, the main general objective of the study is to analyse causes and effects concerning tax evasion in Sekondi-Takoradi Metropolitan Assembly of the Western Region of The Republic of Ghana. Next, we explain the data and methods used.

#### 3.1. Data collection analysis

The final sample size of ninety-seven (97) respondents from the Sekondi-Takoradi Metropolitan Assembly of the Western Region of The Republic of Ghana. The study adopted a self-completed questionnaire (using Likert scale) as the main tool for collecting primary data. The self-completed questionnaires were administered by hand to selected respondents and later collected. The study employed descriptive statistics and tests to analyse data, and the results are presented in charts and tables in the subsequent pages.

#### 3.2. Objectives and hypothesis

The next table provides information about the objectives and the hypothesis.

*Table 1: Objectives and Hypotheses*

Label	Objectives or Research Hypotheses	Technique
O <sub>1</sub>	Identify the <i>age bands</i> with more propensity to <i>tax evasion</i>	Mean and Standard deviation. Frequency tables.
O <sub>2</sub>	Identify the <i>marital status</i> with more propensity to <i>tax evasion</i>	Mean and Standard deviation. Frequency tables.
O <sub>3</sub>	Identify the <i>type of business</i> with more propensity to <i>tax evasion</i>	Mean and Standard deviation. Frequency tables.
O <sub>4</sub>	Identify the <i>years in business</i> with more propensity to <i>tax evasion</i>	Mean and Standard deviation. Frequency tables.
H <sub>1</sub>	There is an association between variables <i>gender</i> and <i>tax evasion</i>	Chi-Square test
H <sub>2</sub>	There is an association between variables <i>education</i> and <i>tax evasion</i>	Chi-Square test
H <sub>3</sub>	There is an association between <i>number of employees</i> and <i>tax evasion</i>	Chi-Square test
H <sub>4</sub>	There are differences by <i>gender</i> regarding <i>causes and effects</i> of <i>tax evasion</i>	Student t-test
H <sub>5</sub>	There are differences between the <i>age bands</i> regarding <i>causes and effects</i> of <i>tax evasion</i>	kruskal-Wallis
H <sub>6</sub>	There are differences between the <i>education</i> regarding <i>causes and effects</i> of <i>tax evasion</i>	kruskal-Wallis
H <sub>7</sub>	There are differences between the <i>marital status</i> regarding <i>causes and effects</i> of <i>tax evasion</i>	kruskal-Wallis
H <sub>8</sub>	There are differences between the <i>type of businesses</i> regarding <i>causes and effects</i> of <i>tax evasion</i>	kruskal-Wallis
H <sub>9</sub>	There are differences between <i>years in business</i> regarding <i>causes and effects</i> of <i>tax evasion</i>	Student t-test
H <sub>10</sub>	There are differences between <i>number of employees</i> regarding <i>causes and effects</i> of <i>tax evasion</i>	kruskal-Wallis

## 4. RESULTS AND DISCUSSION

### 4.1. Taxpayers profile

The next table shows the respondents' profile. According to the data collected, the total number of respondents is 97; two-thirds of the respondents are males, and one-third are females. In terms of age bands, 44,30% of the respondents have in between 31 and 35 years old. Regarding the education level, 42,3% hold a secondary/technical degree, 20,6% have a tertiary degree; 23,7% declare another education background. There are 13,4% with no educational background.

*Table 2: Profile of respondents*

	N	%
<b>Gender</b>		
Male	64	66,0
Female	33	34,0
<b>Total</b>	<b>97</b>	<b>100,0</b>
<b>Age</b>		
Below 25	4	4,1
26-30	11	11,3
31-35	43	44,3
36-40	25	25,8
Above 41	14	14,4
<b>Total</b>	<b>97</b>	<b>100,0</b>
<b>Educational background</b>		
Secondary/Technical	41	42,3
Tertiary	20	20,6
No Education	13	13,4
Other	23	23,7
<b>Total</b>	<b>97</b>	<b>100,0</b>
<b>Marital status</b>		
Single	24	24,7
Married	61	62,9
Divorced	10	10,3
Other	2	2,1
<b>Total</b>	<b>97</b>	<b>100,0</b>
<b>Type of business</b>		
Manufacturing	2	2,1
Service	17	17,5
Distribution	16	16,5
Retailing	57	58,8
Other	5	5,2
<b>Total</b>	<b>97</b>	<b>100,0</b>

Regarding marital status, the majority is married – 62,9%, 24,7% are single and 10,3% are divorced. To ascertain the types of business the respondents engaged in the following was added. 2.1% are in manufacturing, 17.5% in services. 16.5% are into distribution whilst 58.8%, are in the retailing of goods. The conclusion can be made that more than half of the population surveyed are into retailing.

#### 4.1.1. Gender and age

Four out of the 97 respondents were below the age of 25 years, made up of 50% male and female apiece. Eleven respondents fell between the ages of 26 – 30 years. 81,8% and 18,2% were male and female, respectively. 62,8% male and 37,2% female of 11 respondents out of the total 97 were between the ages of 31 – 35 years. In the 36 – 40 years age range, 25 respondents out of 97 were 68,0% male and 32,0% female. Fourteen (14) out of the 97 respondents made up of 64,3% male and 35,7% female were above 41 years.

*Table 3: Gender vs. age*

		Gender		Total
		Male	Female	
Below 25	N	2	2	4
	% Age	50,0%	50,0%	100,0%
	% Gender	3,1%	6,1%	4,1%
	% of Total	2,1%	2,1%	4,1%
26-30	N	9	2	11
	% Age	81,8%	18,2%	100,0%
	% Gender	14,1%	6,1%	11,3%
	% of Total	9,3%	2,1%	11,3%
31-35	n	27	16	43
	% Age	62,8%	37,2%	100,0%
	% Gender	42,2%	48,5%	44,3%
	% of Total	27,8%	16,5%	44,3%
36-40	n	17	8	25
	% Age	68,0%	32,0%	100,0%
	% Gender	26,6%	24,2%	25,8%
	% of Total	17,5%	8,2%	25,8%
Above 41	n	9	5	14
	% Age	64,3%	35,7%	100,0%
	% Gender	14,1%	15,2%	14,4%
	% of Total	9,3%	5,2%	14,4%
Total	n	64	33	97
	% Age	66,0%	34,0%	100,0%
	% Gender	100,0%	100,0%	100,0%
	% of Total	66,0%	34,0%	100,0%

#### 4.1.2. Business and education

Forty-One out of the 97 respondents made up of 4,9% in manufacturing, 14,6% in service, 9,8% in distribution, 68,3% in retailing and 2,4% in the other business categories had Secondary/Technical education. The Tertiary education saw twenty respondents made up of 15,0% apiece in service and distribution and 70,0% in retailing. For No Education category of respondents, 23,1% were into service, 7,7% into distribution and 69,2% into retailing. Twenty-three respondents out of the 97 made up of 21,7%, 34,8%, 26,1% and 17,4% in the business of service, distribution, retailing and others, respectively, had some other forms of education.

*Table following on the next page*

Table 4: Business vs. education

		Type of business				
		Manufacturing	Service	Distribution	Retailing	Other
Secondary/Technical	n	2	6	4	28	1
	% educational background	4,9%	14,6%	9,8%	68,3%	2,4%
	% Type of business	100,0%	35,3%	25,0%	49,1%	20,0%
	% of Total	2,1%	6,2%	4,1%	28,9%	1,0%
Tertiary	n	0	3	3	14	0
	% educational background	0,0%	15,0%	15,0%	70,0%	0,0%
	% Type of business	0,0%	17,6%	18,8%	24,6%	0,0%
	% of Total	0,0%	3,1%	3,1%	14,4%	0,0%
No Education	n	0	3	1	9	0
	% educational background	0,0%	23,1%	7,7%	69,2%	0,0%
	% Type of business	0,0%	17,6%	6,3%	15,8%	0,0%
	% of Total	0,0%	3,1%	1,0%	9,3%	0,0%
Other	n	0	5	8	6	4
	% educational background	0,0%	21,7%	34,8%	26,1%	17,4%
	% Type of business	0,0%	29,4%	50,0%	10,5%	80,0%
	% of Total	0,0%	5,2%	8,2%	6,2%	4,1%
Total	n	2	17	16	57	5
	% educational background	2,1%	17,5%	16,5%	58,8%	5,2%
	% Type of business	100,0%	100,0%	100,0%	100,0%	100,0%
	% of Total	2,1%	17,5%	16,5%	58,8%	5,2%

## 4.2. Descriptive Statistics Analysis

### 4.2.1. Profile and tax evasion

According to the respondents we present some pertinent issues concerning profile characteristics and tax evasion in the past - question 16A “have you evaded tax before”. Globally 30% of the people declared that had evaded tax before, 42% declared that never evade tax before and 28% are not sure.

- *Gender vs. tax evasion* - Regarding gender (66% males; 34% females) and question 16A (have you ever evade tax before), the percentage of males (29,7%) and females (30,3%) that declared had evaded tax before is similar. Therefore, at first sight the behavior seems to be analogous. On the other hand, 50% of men declared never evade tax before, contrary to females (27,3%). The “not sure” answer was higher for females (42,4%) against 20,3% of males.
- *Age vs. tax evasion* - The age band declaring had “evaded tax before” with higher percentage is 26-30 years. The lower percentage is band age 31-35 (45,5%) and below 25 (25%).
- *Education vs. tax evasion* - Concerning education and tax evasion in past, respondents with higher education levels are those that declare more evasion before: “had evaded tax before” 45% -Tertiary, 29, 3%. While respondents with no education and other show a percentage of 23,1% and 21,7%, respectively.

- *Marital status vs. tax evasion* - Divorced respondents are those that declared had “evaded tax before” - 40%. Single and married show a percentage of 33% and 27,9%, respectively.
- *Type of business vs tax evasion* - The distribution sector of shows the higher percentage of “evade tax before” - 37.5%, retailing sector 30,3%.
- *Years in Business vs. tax evasion* - The majority declares that tax evasion did not in the past (42,3%) against 29,9% of those that answered yes. Regarding “yes answers”, those that are in the business in the band of 1-5 years show the higher percentage (58,6%); “year in business” above 6 years also show a percentage of 37,9%; only the “beginners” (“years in business” lower than 1 year) seems to declare a “yes” answer with lower percentage – 3,4%.

#### 4.2.2. Causes and effects of tax evasion

The next table shows the main descriptive statistics regarding the answers about causes (questions 1B to 16B) and effects (questions 17B to 20B) of tax evasion.

*Table 5: Descriptive statistics for causes and effects of tax evasion*

Statement	Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree	Mean	Standard Deviation
	1	2	3	4	5		
1. A large proportion of taxes is used by the government for meaningless purposes.	50	18	29	-	-	1,8	0,881
	51,5	18,6	29,9	-	-		
2. It is unfair to pay tax.	27	47	19	3	-	2,0	0,781
	28,1	49,0	19,8	3,1	-		
3. The sales tax rate (%) should be the same regardless of the business one is doing.	26	51	15	2	1	2,0	0,784
	27,4	53,7	15,8	2,1	1,1		
5. Waste and inefficiency in government is high.	64	18	15	-	-	1,5	0,752
	66,0	18,6	15,5	-	-		
6. High corruption in government.	44	24	21	6	2	2,0	1,054
	45,4	24,7	21,6	6,2	2,1		
7. Rich people should pay tax at a higher rate.	66	18	13	-	-	1,5	0,722
	68,0	18,6	13,4	-	-		
8. The Tax system is very complicated (I do not know how to calculate my own tax liability).	56	27	13	1	-	1,6	0,762
	57,7	27,8	13,4	1,0	-		
9. The amount of tax I have to pay is reasonable considering the benefits received.	25	55	12	4	1	2,0	0,803
	25,8	56,7	12,4	4,1	1,0		
10. The government provide enough information about how they use taxpayers' money.	59	24	14	-	-	1,5	0,737
	60,8	24,7	14,4	-	-		
11. Tax agents collect the right amount of tax from us.	2	25	25	19	13	3,2	1,103
	2,4	29,8	29,8	22,6	15,5		
12. There is much education on taxation.	59	17	16	3	2	1,7	0,995
	60,8	17,5	16,5	3,1	2,1		
13. A lot of people do not pay tax that is why I do not pay tax as well.	60	20	17	-	-	1,6	0,777
	61,9	20,6	17,5	-	-		
14. Government receives enough tax so it does not matter if some people evade tax.	25	44	23	4	-	2,1	0,818
	26,0	45,8	24,0	4,2	-		
15. The burden of tax is so heavy that many people are forced to evade it in order to survive.	52	28	16	1	-	1,6	0,791
	53,6	28,9	16,5	1,0	-		
16. Wealthy people evade tax more often than the poor.	54	24	18	-	-	1,6	0,785
	56,3	25,0	18,8	-	-		
17. If we do not pay taxes government would not be able to pay its workers.	62	19	16	-	-	1,5	0,765
	63,9	19,6	16,5	-	-		
18. If we do not pay taxes government would not be able to provide infrastructure.	41	44	6	1	-	1,6	0,656
	44,6	47,8	6,5	1,1	-		
19. Tax evasion would decrease government revenue.	63	19	14	1	-	1,5	0,779
	64,9	19,6	14,4	1,0	-		
20. Tax evasion causes inequality and increase the tax burden on others.	61	20	16	-	-	1,5	0,765
	62,9	20,6	16,5	-	-		
<b>Global mean</b>						<b>1,8</b>	<b>0,816</b>

*Note: 1-Strongly disagree; 2-Disagree; 3-Neither agree nor disagree 4-Agree; 5-Strongly agree; SD-Standard Deviation*

#### Causes of tax evasion:

- In general, people agree that the government uses a large proportion of taxes for meaningless purposes; 51.5% strongly agree and 18.6% agree, and 29.9% neither agree/disagree, respectively.
- 28.1% of the respondents strongly agree that it is unfair to pay tax whilst 49.0%, 19.8% and 3.1% agree, neither agree/disagree and disagree respectively.
- On the question of making the sales tax rate equal across board, 27.4% respondents strongly agree, 53.7% respondents agree, 15.8% neither agree/disagree, 2.1% and 1.1% respondents respectively responded disagree and strongly disagree.
- 66.0%, 18.6%, and 15.5% of the respondents respectively strongly agree and neither agree/disagree to the question of whether waste and inefficiency in government in terms of expenditure is high.
- On high corruption in government, 45.5% of respondents strongly agree, 24.7%, 21.6%, 6.2%, and 2.1% of the respondents respectively agree, neither agree/disagree, disagree and strongly disagree.
- 68.0%, 18.6%, 13.4% of the respondents strongly agree, agree and neither agree/disagree respectively to the question as to whether rich people should pay a higher tax rate.
- On whether the tax system is complicated, 57.7%, 27.8%, 13.4% and 1.0% of the respondents strongly agree, agree, neither agree/disagree and disagree, respectively.
- 25.8%, 56.7%, 12.4%, 4.1% and 1.0% of the respondents respectively strongly agree, agree, neither agree/disagree, disagree and strongly disagree on whether their tax values are reasonable or otherwise.
- On the government provision of sufficient information regarding tax expenditure, 60.8% respondents agree, 24.7% respondents agree, 14.4% respondents neither agree/disagree.
- On whether tax agents collect the right amount of taxes 2.4% respondents strongly agree, 29.8% appease responded agree and neither agree/disagree, 22.5% and 15.5% respondents disagree and strongly disagree respectively.
- Whether there is much education on taxation, 60.8% of respondents strongly agree, 17.5% and 16.5% of respondents agree and neither agree/disagree, while 3.1% and 2.1% of respondents disagree and strongly disagree.
- 61.9%, 20.6%, and 17.5% of the respondents strongly agree, agree, and neither agree/disagree to whether they evade tax because many people do not pay tax.
- 26.0% strongly agree, 45.8% agree, 24.0% neither agree/disagree and 4.2% disagree to the question of the irrelevance of some people not paying tax since the government receives enough tax revenue.
- 53.6%, 28.9%, 16.5%, and 1.0% of the respondents strongly agree, agree, neither agree/disagree and disagree to higher tax burden due to tax evasion.
- On the question of wealthy people evading tax more than the poor, 56.3% strongly agree, 25.0% and 18.8% responded agree and neither agree/disagree respectively.

In the group of causes of tax evasion, the most relevant are “waste and inefficiency in government is high”, “rich people should pay at a higher rate”, “government should provide enough information about the use of the taxpayers”.

#### Effects of tax evasion:

- 63.9%, 19.6% and 16.5% respectively strongly agree, agree and neither agree/disagree on the question that if taxes are not paid government can not pay its workers.

- On the question of the government's inability to provide infrastructure if taxes are not paid 44.6%, 47.8%, 6.5% and 1.1% strongly agree, agree, neither agree/disagree and disagree, respectively.
- 64.9% strongly agree, 19.6% agree, 14.4% neither agree/disagree and 1.0% disagree that tax evasion decreases government revenue.
- On the question of tax evasion causing inequality and increasing tax burden on others, 62.9% strongly agree, 20.6% agree and 16.5% neither agree/disagree.
- In the group of effects, all were equal measured by the respondents; only government "would not be able to pay infrastructure" shows a very lower mean (1,6).

### 4.3. Results

Considering the objectives and the hypotheses\* previously stated, the evidence obtained is as follows:

*Table 6: Evidence obtained*

Label	Objectives or Research Hypotheses	Conclusion
O <sub>1</sub>	Identify the <i>age bands</i> with more propensity for <i>tax evasion</i>	Age band with more tax evasion: 31-35 (34,5%); 36-40 (27,6%)
O <sub>2</sub>	Identify the <i>marital status</i> with more propensity for <i>tax evasion</i>	From 29 respondents that declared committed tax evasion, 58,6% are married
O <sub>3</sub>	Identify the <i>type of business</i> with more propensity for <i>tax evasion</i>	The activity sector with more propensity for tax evasion is the retail sector: 65,5%
O <sub>4</sub>	Identify the <i>band years in business</i> with more propensity for <i>tax evasion</i>	The businesses with more propensity to tax evasion are business established within 1 to 5 years (58,6%)
	p-value	Conclusion
H <sub>1</sub>	There is an association between variables <i>gender</i> and <i>tax evasion</i>	$\rho=0,039$ Corroborated
H <sub>2</sub>	There is an association between variables <i>education</i> and <i>tax evasion</i>	$\rho=0,135$ Not corroborated
H <sub>3</sub>	There is an association between <i>number of employees</i> and <i>tax evasion</i>	$\rho=0,693$ Not corroborated
H <sub>4</sub>	There are differences by <i>gender</i> regarding <i>causes</i> and <i>effects</i> of tax evasion	$\rho=0,148$ ; $\rho=0,867$ Not corroborated
H <sub>5</sub>	There are differences between the <i>age bands</i> regarding <i>causes</i> and <i>effects</i> of tax evasion	$\rho=0,496$ ; $\rho=0,031$ Not corroborated; Corroborated
H <sub>6</sub>	There are differences between the <i>education</i> regarding <i>causes</i> and <i>effects</i> of tax evasion	$\rho=0,496$ ; $\rho=0,457$ Not corroborated
H <sub>7</sub>	There are differences between the <i>marital status</i> regarding <i>causes</i> and <i>effects</i> of tax evasion	$\rho=0,728$ ; $\rho=0,284$ Not corroborated
H <sub>8</sub>	There are differences between the <i>type of businesses</i> regarding <i>causes</i> and <i>effects</i> of tax evasion	$\rho=0,032$ ; $\rho=0,428$ Corroborated; Not corroborated
H <sub>9</sub>	There are differences between <i>years in business</i> regarding <i>causes</i> and <i>effects</i> of tax evasion	$\rho=0,878$ ; $\rho=0,102$ Not corroborated
H <sub>10</sub>	There are differences between <i>number of employees</i> regarding <i>causes</i> and <i>effects</i> of tax evasion	$\rho=0,241$ ; $\rho=0,604$ Not corroborated

\* Globally results for causes and effects (i.e group); Individual results (by question) are presented below in the discussion comments



Therefore, the evidence obtained is as follows:

- **O1.** According to the results the age bands with more propensity are 31-35 (34,5%) and 36-40 (27,6%).
- **O2.** The marital status with more propensity for tax evasion are married people (58,6%).
- **O3.** the type of business with more propensity for tax evasion are retailers (65,5%).
- **O4.** The band years in business with more propensity for tax evasion are 1-5 (58,6%).
- **H1.** Since the *p-value* is lower than our chosen significance level ( $\alpha = 0,05$ ), we conclude that there is an association between “gender” and “tax evasion” ( $p=0,039$ ).
- **H2.** Since the *p-value* is greater than our chosen significance level ( $\alpha = 0,05$ ), we do not reject the null hypothesis; we conclude that there is not enough evidence to suggest an association between “education” and tax evasion ( $p=0,135$ ).
- **H3.** Considering  $\alpha = 0,05$ , we do not reject the null hypothesis; we conclude that there is not enough evidence to suggest an association between the size measured by the “number of employees” and tax evasion and ( $p=0,693$ ).
- **H4.** Globally, there is no association by gender regarding “causes” and “effects” of tax evasion ( $p=0,148$  and  $p=0,867$ ), respectively). Individually, there are no association by gender and “causes” and “effects” of tax evasion (we conclude that there is not enough evidence to suggest an association).
- **H5.** Due to the violation of the normality assumption, the non-parametric test Kruskal-Wallis was used. We do not reject the null hypothesis; globally, we conclude that there is no association between “age” and the “causes” of tax evasion ( $p=0,496$ ). However, there is an association between “age” and the “effects” of tax evasion ( $p=0,031$ ). Individually, we did not find any association between age and *causes* and/or *effects*.
- **H6.** Concerning the “education” background, globally, we conclude that there is no association between “education” and the “causes” and “effects” of tax evasion ( $p=0,496$  and  $p=0,457$ ), respectively). Individually, we conclude that there is an association between “education” and “causes” and “effects”:

Causes:

- 1B “a large proportion of taxes is used by the government for meaningless purposes” (respondents with “tertiary education” agree more, mean: 1,55 +/-0,826);  $p=0,004$ .
- 9B “the amount of tax I have to pay is reasonable considering the benefits received”; (respondents with “tertiary education” agree more, mean: 1,70 +/-0,801);  $p=0,020$ .
- 13B “a lot of people do not pay tax that is why I do not pay tax”; (respondents with “secondary/technical education” agree more, mean: 1,34 +/-0,656)  $p=0,011$ .
- 14B “government receives enough tax, so it does not matter if some people evade tax”; (respondents with “no education” agree more, mean: 1,50 +/-0,798);  $p=0,014$ .
- 15B “the tax burden is so heavy that many people are forced to evade it in order to survive” (respondents with “tertiary education” agree more, mean: 1,55 +/-0,605);  $p=0,016$ .
- 16B “wealthy people evade tax more often than the poor” (respondents with “tertiary education” agree more, mean: 1,45 +/-0,686);  $p=0,022$ .

Effects:

- (vii) 19B “tax evasion would decrease government revenue” (respondents with “no education” agree more, mean: 1,23 +/-0,599);  $p=0,016$ .
- **H7.** Concerning the “marital status”, globally, we conclude that there is no association between “marital status” and the “causes” and “effects” of tax evasion ( $p=0,728$  and  $p=0,284$ , respectively). Individually, we conclude that there is a significant association between “marital status” and “causes” (not “effects”):

## Causes:

- 8B. “the tax system is very complicated” (respondents single agree more, mean: 1,38 +/- 0,824);  $p=0,012$ .
- 9B. “the amount of tax a have to pay is reasonable considering the benefits received” (respondents divorced agree more, mean: 1,2 +/- 0,422);  $p=0,001$ .
- 11B. “tax agents collect the right amount of tax from us” (respondents divorced agree more, mean: 2,5 +/- 0,707);  $p=0,026$
- **H8.** Regarding “type of business”, globally, we conclude that there is a statistic association between “type of business” and the “causes” of tax evasion ( $p=0,032$ ). There is no association with “effects”. Individually, we conclude that there is a significant association between “type of business” and “causes” of tax evasion (no association with effects).

## Causes:

- 2B. “It is unfair to pay tax” (respondents retailers agree more, mean: 1,86 +/- 0,773);  $p=0,039$ .
- **H9.** Regarding “years in business” globally, we conclude that there is no association with tax evasion causes and effects. Individually, we conclude that there is a significant association between “years in business” and “effects” of tax evasion (not with causes).

## Effects:

- 20B. “tax evasion causes inequalities and increase the tax burden on others” (respondents “up to five” agree more, mean: 1,36 +/- 0,563);  $p=0,021$ .
- **H10.** Regarding “number of employees”, globally, we conclude there is no association with “causes” and “effects of tax evasion. Individually, we conclude that there is a significant association between “number of employees” and “causes” of tax evasion (not with effects).

## Causes:

- 7B. “rich people should pay tax at a higher rate” (respondents “10 and above”, mean: 1,15 +/- 0,555);  $p=0,031$ .

## 5. CONCLUSION

Considering the aim of this study (and his exploratory character) we found evidence concerning the causes and effects of tax evasion/avoidance in the Sekondi-Takoradi Metropolitan Assembly of the Western Region of The Republic of Ghana (according to the respondent’s opinion). People within 31 to 40 years and married people are those that engage more in tax evasion. The retail sector and businesses from 1 to 5 years old are those that show more propensity to tax evasion. There are differences between males and females regarding tax evasion. More females denied that committed tax evasion or are not sure about their behaviour. We found no evidence regarding the education profile and past tax evasion events (no differences found). The company’s size, measured by the number of employees, does not show differences in relation to tax evasion. Regarding the causes and effects of tax evasion, we found the following evidence:

- 1) in relation to gender, no differences were found.
- 2) in relation to age, there are no differences concerning the *causes*, however, there are differences regarding the *effects*.
- 3) There are no significant differences globally in relation to “education” background. However, individually, about the *causes* and *effects* there are differences. The most significant *causes* are the uses of tax for meaningless purposes, the benefits received are not reasonable taking into account the amount of tax paid; the moral issues – “I do not pay tax because the others do not pay”, the amount of tax is enough, therefore, if I do not pay does

not matter, the “tax burden is so high that people needs to evade in order to survive” and “wealthy people evade more than the poor”. The main *effect* of tax evasion is the decrease of government revenue.

- 4) In terms of marital status, globally there are no differences between married and divorced respondents in relation to causes and effects. However, individually, we found differences only in relation to *causes* of tax evasion: “the complexity of the tax system”, “the benefits are no fair considering the tax amount paid” and the “correct amount of tax collected by the tax agents”; no differences were found in *effects*.
- 5) In terms of “type of business”, globally, there are differences only in relation to *causes*. We only identified differences in the causes individually – “it is unfair to pay tax”.
- 6) Globally, we found no differences between “years in business” and the *causes* and *effects* on tax evasion. Nonetheless, individually, there are differences regarding *effects* – the tax evasion leads to inequalities and increase the tax burden on others.
- 7) In the factor size of the small entities, measured by the “number of employees”, globally, there are no significant differences on cause and effects. Individually, the most significant *cause* of tax evasion is because rich people should pay a higher rate; no significant *effects* were found.

In summary, the retail sector is more prone to tax evasion, and females have different behaviour than males. In relation to cause and effects, education and marital status are the factors that show the main differences.

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## LIVELIHOOD STRATEGIES OF ORGANIC COCOA PRODUCERS IN SÃO TOMÉ AND PRÍNCIPE

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### **ABSTRACT**

*The production of cocoa in São Tomé and Príncipe is an important activity, both in socio-cultural and economic terms, as it is the largest contributor to the country's GDP and national exports. However, small producers who insure it, associated with two cooperatives, experience several difficulties and are either faced with the dilemma of producing traditional vs organic cocoa, the latter having some advantages related to its superior market value or, to replace the production of cocoa for another more profitable crop. The objective of this work was to identify and understand the livelihood strategies of cocoa producers in São Tomé and Príncipe. To this end, in addition to reviewing the literature on the subject, the methodological procedures included conducting an empirical study with a quantitative and descriptive approach, with the collection of documentary and bibliographic information from secondary sources and, the gathering of primary information through the application of a questionnaire to a sample of 200 households as well as field observation. The results made possible to identify the producers' livelihood strategies, showing that there is no gap between traditional and organic cocoa cultivation, since the vast majority of small producers and families in the sample cultivated mainly organic cocoa. Different profiles of livelihood strategies related to the allocation of capital assets and income variables were also identified. Families with a low proportion of allocated land had higher income diversification strategies and vice versa. This study also showed that the lack of appropriate incentives can threaten the future of cocoa cultivation in the country, since the national policy for the rehabilitation and support of cacaueiros had little impact on the profiles that most depend on cocoa cultivation and have less endowment. asset.*  
**Keywords:** Organic Cocoa, Profiles, Small Producers, Strategies, Subsistence

### **1. INTRODUCTION**

Although cocoa connects farmer families or their representatives to a global value chain and markets, driven by strong, consistent demand and asymmetric power, they face challenges concerning matters like the climate, education and health and must adapt to severe crop loss

due to disease, outdated farming techniques and limited governance and/or organizational support, among others (Prazeres & Lucas, 2020; Prazeres, Lucas & Marta-Costa, 2021). Thus, in order to sustain themselves, cocoa farmers seek different strategies to improve income and family well-being, by getting involved in economic activities that are complementary to agriculture, such as informal economy, making decisions about whether to commercialize the production or working outside the farm (Rapsomanikis, 2015). Labor practices are one of these issues, as children often participate in hazardous farming tasks or work at the expense of attending school. These smallholders' decisions-making processes entail production, commercial and environmental possibilities and risks, and are taken in a context of scarce resources and insufficient information or knowledge - especially about prices and markets functioning - and climatic adversities (Prazeres et al., 2022a). In São Tomé and Príncipe (STP), where agriculture comprises a third of the active population, there are two models of cocoa production: conventional cocoa, with a total yield production of 2,488 ton in 2017, which is very dependent on the prices of the New York Stock Exchange and, the certified cocoa (total production of 1,065 ton in 2017), both organic and organic associated with fair trade circuits (EU, 2021). All of STP's cocoa production, of which 99% is exported, has its organoleptic quality recognized in the international market, with 30% being classified in the category of "fine and aroma" (EU, 2021). Cocoa contributes to over 90% of the national exports, standing out from other products such as coffee, coconut, flowers, pepper and other spices, which are also exported. In addition to its contribution to GDP (21%), both the conventional and certified cocoa production guarantee the livelihood of many families, by creating jobs, developing local microeconomies and giving an international image to the country (Prazeres, 2019). Approximately three thousand and three hundred organic producers are integrated into cooperatives (CECAB and CECAC11), though there are also organic private companies with their own production, of which Satocão and Diogo Vaz are the most relevant, the latter having its own chocolate factory and shops (Prazeres, 2019). The overall goal of this study is to identify and compare the livelihood strategies of small organic cocoa producers in STP. This objective can be further realized by answering the following questions: (1) what are the characteristics of organic cocoa farmers? (2) what are the differences among farmers' organic-cocoa-growing practices including area, labour, yield and income across livelihood strategies.

## **2. LITERATURE REVIEW AND Theoretical framework**

Smallholder farmers face several problems and challenges such as isolation, farm size, low levels of technology and productivity and farming systems under traditional practices (Morton, 2007; Prazeres et al., 2021). Additionally, these farmers are constrained by limited resources and need to consider other livelihood activities when making the choices on their livelihood strategies (Giller et al., 2009). Thus, in the literature, the households constitute the basic unit of analysis in several studies which focus on smallholder farmers, assessing three closely connected components: activity variables, capital assets and outcomes (Ellis, 2000; Winters et al., 2009; Nielsen et al., 2013; Walelign & Jiao, 2017). The integrated smallholder livelihood strategy framework based on the Household Livelihood Strategy framework (HLS) and Sustainable Rural Livelihoods framework (SRL) includes the context, livelihood assets, livelihood strategies and livelihood outcomes (Nielsen et al., 2013; Ellis, 2000; Scoones, 2009; Batterbury, 2016; Jansen et al., 2006; Zhang et al., 2022; Musumba et al., 2022). The key goal of this composed framework of a three-step approach is to explain what smallholder farmers own, what they are doing and what they tend to achieve when they live in vulnerable environments. Hence, the identification of which combination of livelihood assets is required for different livelihood strategy combinations, is a key step in the analysis process (Díaz-Montenegro et al., 2018).

Zhang et al. (2022) defined a smallholder livelihood strategy framework constituted by the interaction of variables of context, livelihood asset, livelihood strategies and livelihood outcomes. The context refers to the external environment that influences the livelihoods of smallholder farmers which can directly affect their livelihood assets, strategies, and outcomes. For example, farm size in STP is closely related to the state land system and the organic cocoa price depends on the international price. Therefore, the availability of agricultural materials can influence both, the farmers' willingness to grow organic cocoa and their respective earnings (Prazeres, 2019). The resource base for the study are the diverse capital assets (human, physical, social, financial and natural) that can induce direct benefits for owners without livelihood activities. They constitute the families' livelihood assets and play an important role in their adoption of livelihood strategies (Pour et al., 2018). So, to achieve livelihood goals, the strategies combine a series of actions which engage several people from the household. All the actions taken by the household to produce outcomes, using a single or a set of assets, are defined as activities (Winters et al., 2009). Some activities from non productive assets have a key role in the livelihood strategy selection for developing countries (Nielsen et al., 2013; Walelign, 2016; Walelign et al., 2017). Generally, the criteria for choosing the activity under each livelihood strategy attend to the use by the households of the principle assets, land and labor (Jansen et al., 2006). Different livelihood strategy profiles can be found, by using, as a grouping criteria, the proportions of assets allocated by the smallholders that generate different income activities (Jansen et al., 2006; Nielsen et al., 2013; Hua et al., 2017; van den Berg, 2010; Savari et al., 2022). For example, in some situations, the successful intensification of organic cocoa growth may combine access to natural capital (e.g., land, water) with economic capital (e.g., technology, credit). For others, social capital (e.g., labor sharing arrangements between associations or cooperatives) may be more important. Even when the households' choices induce the same livelihood activities (e.g., livestock and off-farm employment), their time or capital used on the diverse livelihood activities may be different (Jiao et al., 2017). The livelihood outcomes are achieved through livelihood strategies, such as increased income and multidimensional wellbeing, and more sustainable use of natural resources (Babulo et al., 2008). Depending on the situation, these outcomes can be used for consumption, commercialization or conversion into livelihood assets (Zhang et al., 2022).

### 3. APPROACH AND METHODS

The study was conducted between July and December 2021, in the districts where the agroecological conditions are suitable for growing cocoa. The existing networks and previously built partnerships were used, in addition to a representation of the two contrasting cooperatives. The approach included six stages, each one building on the findings of the previous: (i) literature review undertaken to provide background information on organic cocoa smallholders' systems and rural livelihoods in STP and the challenges and factors that influence them (policies, institutions, challenges, shocks and trends). Such was complemented by the information provided by the interviews and focus group with the organic cocoa value chain key actors, from a previous study performed by the research team; (ii) participatory identification of indicators for livelihood strategies of organic cocoa producers; (iii) a survey of 200 smallholders to collect quantitative information about livelihood strategies, as well as general information about household and farm's characteristics; (iv) field observation during the entire period when empirical data collection took place, in order to complement the information collected; (v) cluster analysis to identify patterns and select strategies, with a previous descriptive statistics' analysis to identify the basic grouping patterns; and, (vi) development and validation of the recommendations with smallholders, communities and other stakeholders, and assurance of the necessary explanations. Data analysis was implemented by using SPSS 19.0 software.

The willingness of smallholders to participate in the study and their accessibility were also considered. The quantitative research meetings were initially held with presidents of the two cooperatives of each of the communities, to explain the goals and methodology of the study. Each survey interview lasted approximately 45 min. 200 heads of smallholders, who were not randomly sampled, were interviewed (123 from CECAB and 77 from CECAC11). The criteria was both, the cooperative suggestions and the availability of the producer to cooperate with the research. Compliance with the General Data Protection Regulation was assured throughout. The participants were informed about the use of the information, their rights, and their responses were anonymized. The study area included the most important cocoa farming districts and rural communities in STP, where the organic cocoa is the crop with the largest growing area and its smallholders belong to one of the two cooperatives of organic cocoa. This means the study had a representation of all of districts in the country, with exception of Caué, Pagué and Santo António - districts in the Príncipe Island - because they do not have organic cocoa certified farming. Table 1 summarizes the principal statistics of surveyed smallholders.

Variable	Frequency	Percentage	Min	Max
Age (40-60 Years)	127	63,5	24,0	81,0
Gender (Female)	66	33,0	-	-
Role in family (Chef)	143	71,5	uncle	wife
Education (Primary Studies)	167	83,5	No education	Graduation
Professional Training (Organic Cocoa)	98	49,0	Greenhouses	Organic cocoa
Household size (Nr.)	2,1	55,5	1,0	3,0
Land area (ha)	2,1	100	1,0	2,5
Married or living together (%)	176	88	-	-
Cooperative (CECAB)	123	61,5	-	-
Cocoa Monoculture (Nr.   ha)	34 (2,1)	17,0	1,0	2,5
Cocoa and Banana Crops (Nr.   ha)	116 (2,1)	58,0	1,0	2,5

*Table 1: Summary statistics of surveyed respondents*

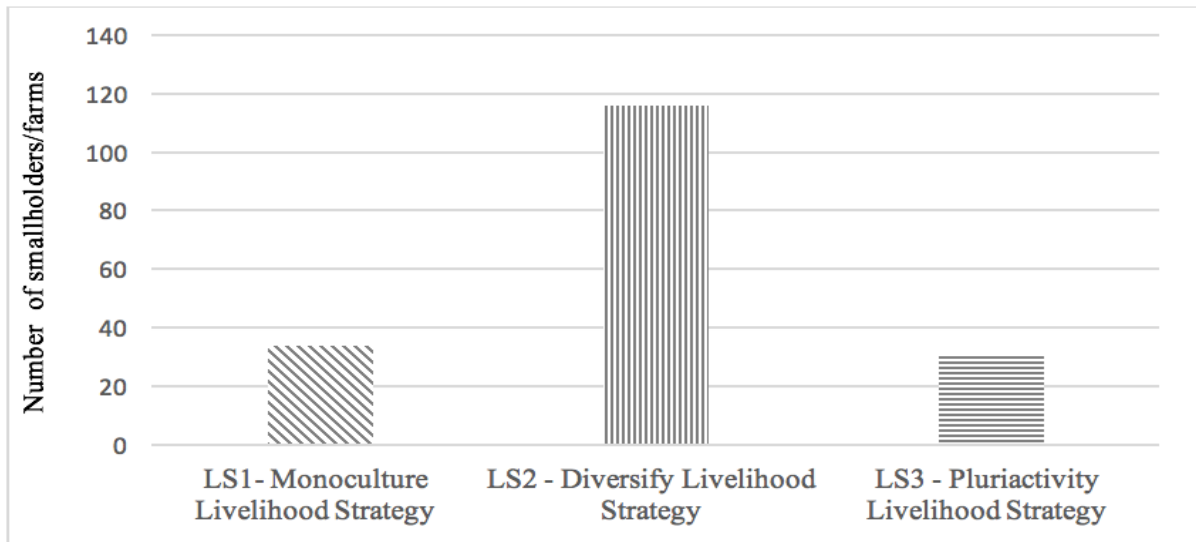
## 4. RESULTS

### 4.1. Classification of livelihood strategies

According to the investigation of Zhang et al. (2022), three types of livelihood strategies were identified in the study area, which were differentiated by the number and proportion of farmers engaged in growing organic cocoa (with or without other crop combinations), and their ways of allocating resources. Among them, 27,5% are the proportion of farmers who engage solely in organic cocoa growing, in monoculture livelihood strategy (LS1). 58% are involved in a diversified livelihood strategy (LS2) with two crops (organic cocoa and banana), and, 14,5% are engaged in a pluriactivity livelihood strategy (LS3), which combine three or more crops and livelihood activities. No farmer in LS2 or LS3 are exclusively engaged in organic cocoa growing.

*Figure following on the next page*





*Figure 1: Classification of smallholder organic cocoa farmers' livelihood strategies*

In order to characterize the three livelihood strategies, an analysis was carried out based on the sociodemographic variables obtained, as well as on issues related to familial labour. Figure 2 summarizes the main sociodemographic characteristics of each livelihood strategy. The gender composition of the head of household within the different strategies is similar, around 70% of men and 30% of women. The producers who adopted LS1 are, on average, older (53,1 years) than those taking the other two strategies (47,9 in LS2 and 47,2 years in LS3). The LS3 has a higher total number of household members (5,9) than the other two strategies, which is due to the presence of a greater number of male members, 3,29 versus 1,85 in LS2 and 1,72 in LS3. Moreover, the household size increases from the LS1 to LS3, with the number of crops reached. The farmers who adopted the LS3, have more education, belong to upper classes, have more mixed race and white individuals and, have the big proportion of family members engaged in off-farm employment (Figure 2). For Zhang et al. (2022) generally, the health status of farmers will be deteriorated with age reason, being reasonable that the youngest have better health. In this study there are no differences in the health status between the three livelihood strategies' profiles.

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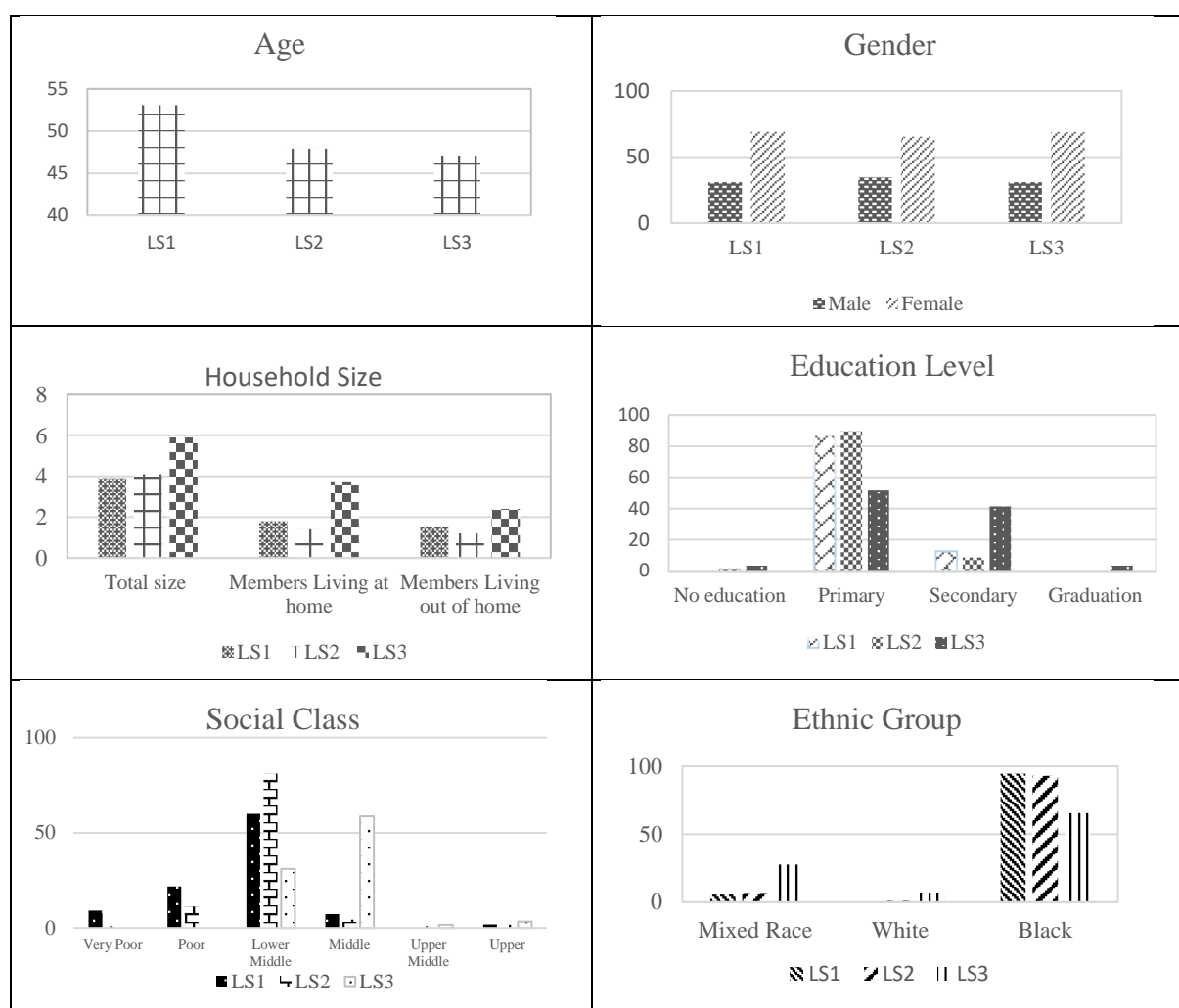


Figure 2: Socio-demographic characteristics of the farmers and households structure on the different strategies

#### 4.2. Comparison of organic cocoa farming practices across livelihood strategies

Table 2 presents the role of family labour, income and savings in livelihood strategy profiles. Income from agricultural product sales and from non-agricultural outside wages is higher in LS3 than in the other two livelihood strategies. On other hand, the proportion of income from agricultural outside wages is elevated in LS2. When farms have savings, they usually elect the bank as their keeper. This is more evident in LS3 than in the others livelihood strategies. Neighbours, cooperative and private banks are the sources used by farmers from LS3 when they applied for a loan. Farmers from the LS2 profile when in need of a loan, requested it mainly from neighbors (Table 2). The comparison of the living conditions among livelihood strategies (Table 3) did not display big differences. Only potable water has less availability to the farmers belonging to profile LS3, who, on the other hand, are also the group with the largest access to internet and lesser access to other services (agricultural/veterinary extension services).

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Variable		LS1	LS2	LS3	Test	p-value
Family work members on the farm		1,5	1,5	1,8	F=2,656	0,075
Family work members outside the farm		1,0	1,1	1,5	F=9,122	0,000
Income from sale of agricultural products (%)		57,8	56,0	74,2	F=12,649	0,000
Income from agricultural outside wages (%)		30,3	35,0	15,9	F=7,977	0,001
Income from non-agricultural outside wages (%)		28,65	30,31	38,33	F=11,326	0,000
Where usually keep savings	Bank	21,8	16,4	37,9	$\chi^2=7,998^a$	0,092
	Cooperative	1,8	0,9	3,4		
	None	76,4	82,8	58,6		
Applied for a loan %		30,0	66,7	34,6	$\chi^2=5,462$	0,065
Loan was requested	Relatives	16,7	13,6	9,1	$\chi^2=81,119$	0,000
	Neighbors	81,3	83,6	27,3		
	Loan Shark	0,0	0,9	0,0		
	Cooperative	2,1	1,8	27,3		
	Private Bank	0,0	0,0	27,3		
	Public Bank	0,0	0,0	9,1		

Table 2: Role of family labour, income and savings in livelihood strategies profiles

Variable	LS1	LS2	LS3	Test	p-value
Potable water	18,2	23,3	34,5	$\chi^2=2,814$	0,245
Electricity	100,0	99,1	96,6	$\chi^2=2,334$	0,311
Harvest storage	98,2	100,0	96,6	$\chi^2=3,299$	0,192
Transport	96,4	97,4	86,2	$\chi^2=6,912$	0,032
Passable road	74,5	78,4	65,5	$\chi^2=2,135$	0,344
Fix phone	3,6	0,9	6,9	$\chi^2=3,868$	0,145
Mobile phone	98,2	96,6	96,6	$\chi^2=0,364$	0,834
Internet	12,7	7,8	37,9	$\chi^2=18,125$	0,000
TV, Radio and other information Media	100,0	98,3	100,0	$\chi^2=1,463$	0,481
Health center, hospital or clinic	100,0	100,0	96,6	$\chi^2=5,926$	0,052
School, University or Educational Center	100,0	100,0	93,1	$\chi^2=11,912$	0,003
Agricultural/veterinary extension services	94,5	96,6	79,3	$\chi^2=11,484$	0,003

Table 3: Role of living conditions in livelihood strategies profiles

Farmers in LS3 allocate relatively more land to organic cocoa than the others (LS1 and LS2) but have a similar share of land allocated to banana as LS2. Also LS3 are the group with the largest share of organic cocoa (significantly) and banana productions (Table 4). This pattern indicates that, despite the support given by the cooperative(s) and the government (transport, drying equipment and others) to all organic cocoa producers, through the cooperatives, there are still important productivity differences among the farmers. Although the households in LS3 could be framed within a strategy of pluriactivity agricultural based on cocoa, their intensification pattern and consequent high productivity relies on family workforce resources. Probably the production system or technology used by the farmers from LS3 allow them to manage several crops exclusively with the family workforce. That is why this group profile can be denominated as *pluriactivity livelihood strategy based on family workforce*. LS1 is the most organic cocoa-oriented profile, having a similar share of land devoted to organic cocoa as LS2. The LS1 profile makes the most intensive use of family labor among the three profiles and relies on the workforce, thus making off-farm family labor irrelevant. This pattern is typical in small farms with intensive production of organic cocoa, where there is an elevated use of labor and minimal linkage to other agricultural and non-agricultural activities.

Households in SL1 can be easily identified, as abovementioned, as *livelihood strategy based on organic cocoa monoculture and on family and external workforce*. SL2 is a profile which has both banana and organic cocoa, with more productive diversification than the LS1 and dedicating the same are of land to the two crops. This is linked to the standard cultivation procedure for organic cocoa, which intermixes other tree crops, such as banana trees, in polyculture agroforestry. On-farm family labor is more important as off-farm family labor, with permanent employment as the main modality for the first case. Households in SL2 follow a strategy of diversification for both crop production and family labor. Thus, this group profile can be named *livelihood strategy with diversified crop and family labor*. When examining the role played by different capital assets within the profiles, it can be observed that natural capital, specifically, the area of cultivated land and human capital (family size) play determinant roles in enabling diversification strategies (either SL2 or SL3). All households, with agricultural diversification (SL2) or intensification strategies (SL1), concern small families that own and cultivate small properties. The pluriactivity strategies (SL3) are characterized by larger family sizes and hiring strategies to cultivate bigger size plots. Concerning the trust in the institutions, there are no evident differences in the three livelihood strategies' profiles.

Variable		LS1	LS2	LS3	Test	p-value
Vocational training courses		1,2	1,3	1,9	F=12,843	0,000
Organic Cocoa Area (ha)		2,1	2,1	2,3	F=1,309	0,272
Production of Organic Cocoa Beans (Kg)		945,6	1055,6	1420,3	F=5,113	0,007
Banana Area (ha)			2,1	2,2	F=0,216	0,643
Production of Banana (Kg)			412,2	478,3	F=1,835	0,178
Proportion of Banana Production Sold (%)			79,4	76,9	F=1,122	0,291
Product drying equipment (%)		98,2%	99,1%	89,7%	$\chi^2=8,703$	0,013
Transports of products %		96,4%	96,6%	65,5%	$\chi^2=32,322^a$	0,000
Type of access to product drying	Own	0,0%	0,9%	3,6%	$\chi^2=21,540$	0,006
	Leased	0,0%	0,9%	3,6%		
	Borrowed	0,0%	1,8%	10,7%		
	Common (Cooperative)	98,1%	94,7%	71,4%		
	From others	1,9%	1,8%	10,7%		

Table 4: Role of agricultural production characteristics in livelihood strategies profiles

## 5. DISCUSSION AND CONCLUSION

This work builds on previous studies assessing STP's organic cocoa production (e.g Prazeres, 2019, Prazeres et al., 2021; Prazeres et al., 2022a) and adopts a statistical approach aligned with the theoretical frameworks to investigate livelihood strategy profiles. The use of the three-step approach and the traditional cluster analysis allowed the final grouping and profile assignment (Van den Bergh and Vermunt, 2019). Smallholders face some opposing goals and trade-offs when cultivating cocoa (Díaz-Montenegro et al., 2018). In order to learn about how they make choices about resource allocation and organic cocoa farming and how they manage its trade-offs, this study used a quantitative approach (questionnaire survey) complemented with a previous qualitative study (Prazeres et al., 2022a), so to identify and compare the livelihood strategies of small organic cocoa producers in STP. Although the crop may accrue premium prices in international specialized markets, and provided potential high-yield benefits, it relies more on external inputs (someones difficult to acquire in national market) and obtains internal lower prices (Prazeres et al., 2022a). The results show that more than two thirds of the sampled households, specifically those showing livelihood strategies focused on organic cocoa diversification (LS2 and LS3), solve this dilemma by allocating a substantial share of their land to concurrent cultivation of other crops.

Likewise, the variable share of land allocated to organic cocoa does not significantly contribute to the adoption of a particular household livelihood strategy, with the exception of the LS1. In line with Zhang et al. (2022), the results reveal that the farmers' age, sex, education level, health, income, household size and land area are related to their choice of livelihood strategies. The most elderly farmers engage exclusively in organic cocoa production (LS1), middle-aged ones engage in diversity (LS2) and pluriactivity (LS3), and young family members are more prone to engage in off-farm employment. Also, the household size increases from LS1 to LS3, with the number of crops reached. The farmers who adopted the pluriactivity livelihood strategy (LS3), have more education, belong to upper classes, have more mixed race and white individuals and, have the greatest proportion of family members engaged in off-farm employment. This study identified three livelihood strategies adopted by organic cocoa farmers, and the composition of the livelihood strategies revealed differences among farmers. For LS1 to LS3, the proportion of income earned from organic cocoa growing accounts for 57,8%, 56,0%, 74,2%, of the total income, and the proportion of labor input for organic cocoa growing accounts for 18.3%, 69.2%, 31.7% of the total labor input. Thus, LS1 farmers are the most dependent on organic cocoa for their livelihoods, followed by LS3, and LS2. Livelihood diversification is a strategy commonly adopted by farmers in order to cope with unpredicted risks and/or maximize benefits (Zhang et al., 2022). For the authors, the reasons why individuals and households pursue diversification as a livelihood strategy, are often divided into two overarching considerations: necessity or choice. The research outcomes also confirmed that smallholders' livelihoods and farming objectives are closely inter-linked. This means, individuals and households use, adapt and combine, strategies that enable them to meet priority objectives. Within the existing context, farmers largely make rational choices when managing trade-offs. They can compromise the scope of the objectives achieved, by pursuing a mix of approaches that meet these objectives, to some extent. In a certain way, this contrasts the prevailing logic of the organic cocoa production mode, which often does not consider the priorities of different farmer typologies. Organic cocoa production is particularly worried with, and relies heavily on, the adoption of defined and specific production practices, technologies and strategies as well as procedures certified by international schemes and independent bodies. Results also reported that it is effective to distinguish livelihood strategies within the criteria of the allocation of inputs to various livelihood crop activities, namely, organic cocoa monoculture or organic cocoa in combination with other crops. For instance, the input of labor and capital (funds and materials) used for livelihood activities can directly reflect farmers' livelihood strategies (Dai et al., 2015; Chen et al., 2017; Jiao et al., 2017). According to this study, farmers mainly engage in three livelihood activities: organic cocoa production, uniquely or in combination with other crops and, always with off-farm employment. Thus, organic cocoa alone does not insure the living conditions of small farmers that would enable them to opt for a specific livelihood strategy. However, the capital assets significantly determine the livelihood strategies of organic cocoa smallholders. Low capital asset endowments hinder transitioning toward more rewarding livelihood strategies. Appropriately, governance and policy interventions in the organic cocoa value chain should be oriented towards enhancing the access to quality asset endowments and providing asset protection for smallholders. Despite the support given by the cooperative(s) and the government to all organic cocoa producers, through the cooperatives, there are still important productivity differences among the farmers. Cooperatives and private companies have focused on technical solutions linked to improving agricultural practices, quality and market prices, with little information on price transmission and governance in the value chain, where the lack of bargaining power contrasts with the concentration of power in other links in the chain (Prazeres et al., 2022a). Consequently, in this context, governance and policy interventions should focus on measures that benefit organic cocoa smallholders through design and structure and which maintain a differentiated national

value chain for the organic cocoa (fine flavor) quality. Ensuring that small farmers receive the incentives that accompany the potential of their crops, such as the premium prices obtained in international markets, would contribute to agricultural sustainability and to enabling small farmer access to more rewarding livelihood strategies. According to Prazeres et al. (2022b), the expectation is that a geographical indication (GI), in addition to the already existing organic certification, may help smallholders and cooperatives achieving better prices for their cocoa beans and promote them more easily. This is also key to improving poverty transitions, to facilitate income diversification and better off-farm opportunities, as they may encourage the expansion of high-quality organic cocoa cultivation, motivate the increase in cocoa productivity and support investments in infrastructure and social safety nets to develop sustainable livelihoods. Thus, a multidimensional policy strategy to promote high-quality organic cocoa cultivation should be emphasized. This should be accompanied by the improved GI branding and management, in which improved asset endowment, income diversification measures and development of a specific national value chain. Therefore, the development interventions that would allow for to effectively participate in value chains would support poor households in building a minimum stock of productive assets, without which the poorest may experience asset depletion and increased vulnerability. Finally, in the framework of the organic cocoa value chain governance and policy interventions, longitudinal data collection and analysis could improve assessment of the pathways that the livelihood strategies of smallholders follow over time under the application of specific sectorial policies.

## 6. FURTHER RESEARCH

Meeting multiple, often competing objectives when seeking sustainable strategies that improve families' subsistence and wellbeing, is a constant challenge for smallholder farmers in STP. Trade-offs between social, economic and environmental goals at different time and spatial scales need to be reconciled, which must be considered in further research. In the context of diversified livelihood strategies, policy interventions should also focus on measures which facilitate income diversification and improve opportunities for off-farm employment. The study of the existing policy and or/new measures and impacts that could add and distribute value to the smallholders, could be another topic of research. It is also desirable to understand how the existing geographical indication could help transitioning towards a sustainability improvement, and contribute to help small farmers and cooperatives achieve better prices for their cocoa beans and promote them more easily. This is another relevant research topic.

**Conflicts of interest:** The authors declare that they have no conflicts of interest.

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## THE IMPORTANCE OF INNOVATION IN CORPORATE COMPETITIVENESS: THE CASE OF LEIRIA REGION

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### ABSTRACT

*The general objective of this research on the subject of innovation and organizational competitiveness is to understand if both concepts are interconnected and if innovation is considered a necessary and/or beneficial condition for the competitiveness of companies in the market in which they operate. In the development of the entire investigation, the concept of innovation and competitiveness is first approached, followed by an attempt to understand how these concepts are interpreted by individuals today. Next, some studies carried out on their different perspectives and points of view are contemplated, such as their limitations, barriers or obstacles that may compromise their good implementation. Finally, the investigation has a more macro line, represented in a survey in order to understand and prove, through bivariate statistics, how the adopted indicators influence the competitiveness and innovation of the top 100 organizations in the Portuguese region of Leiria in 2021.*

**Keywords:** *Innovation, Competitiveness, Investigation, Region of Leiria, Portugal*

### 1. INTRODUCTION

Innovation is seen by several authors as a fundamental tool for economic and business development and growth (Hess and Kazanjian, 2006; Van de Ven, Polley, Garud and Venkataraman, 1999). It is in this perspective that competitiveness is related to the concept of innovation, since it comes from the ability of a company to produce better products/services than its competitors. This ability, competitiveness, is dependent on an organization's ability to innovate and improve its products/services (Porter, 1990). In this context, it is important to know what really influences a company's innovation, given its importance for organizations to become more competitive. The company's level on Research and Development, Knowledge and Competitiveness, Culture of Innovation and Organizational Structure will determine the success of the implementation and development of innovation. In this sense, the following investigation sought to address several indicators of these same aspects. Inspired by the article by Dziallas and Blind (2019), 3 factors which best represent innovation in an organization were selected: Research and Development (RD); Sources of Innovation (SI); and, Knowledge Sharing (KS). This study aims to understand the degree of importance that RD, SI and KS represent for innovation and for the level of ROCE of the organizations that appear on the top of the 100 largest and best companies identified in the magazine of the region of Leiria and municipality of Ourém, edition 4401 of 22 July 2021. This investigation begins with this first introductory point, which addresses some different aspects regarding its key concepts, mentioning the relevance and importance of the theme for an increasingly dynamic, complex, competitive and unstable society, namely in terms of social and economic.

Following this introductory point, there is another one with a literature review, also focused on these concepts, to immediately present the research methodology, which will mainly support the development of the quantitative study. At this same point, the scope and research questions, the design of the questionnaire that will support the quantitative study and the respective methodology are defined. Subsequently, the research hypotheses are developed in detail, covering different aspects, such as Innovation, Competitiveness, Performance and ROCE. Next, the quantitative study is concluded, with the analysis of the Surveys, starting with the description of the data collection process and sample composition, followed by a dimensional evaluation, which precedes the construction of the variables and presentation of the respective descriptive statistics. From here, we start with the tests themselves, with statistical inference for the hypotheses from bivariate analysis, before concluding with the analysis and discussion of the results. Finally, the overall conclusions are presented, in which the results and contributions of all the research carried out are discussed, as well as the main limitations and suggestions for future investigations.

## **2. LITERATURE REVIEW**

There are several authors who have focused on the subject of Innovation until the present day and emphasize its importance for any organization that wants to improve its results and grow economically. According to Schumpeter (1934), innovation is at the heart of several economic changes that have taken place in contemporary society, becoming the main driver of the western capitalist system. Miles and Snow (1978); Alves (2013) described the prospector as one who always seeks to be the first among the pioneers in the development of new products and/or services, having a high capacity in terms of seeking and exploiting market opportunities. Within the scope of the evolution registered regarding the phenomenon of competition at a global level, we have witnessed a profusion of renewed organizational models (see e.g. Marin and Verdier, 2003). The prevalence of strategies focused on innovation and flexibility, the growing importance of knowledge and skills in relation to other assets, the development of structures described in terms of self-managed teams or work in groups with autonomy, and the conception of strategic management between control systems are easily observable changes (Abernethy and Lillis, 2001). This phenomenon has been examined in different literature, among others, the Management literature considered broad organizational projects that contemplated parameters such as support for innovation and flexibility. There is a convergence on the importance and concern of managers and academics in the area of management in order to identify which are the organizational determinants for success or failure, and the concern with innovation and the success of new products and services is fundamental (eg Maidique and Zirger, 1985; Robinson and Fornell, 1985; Lieberman and Montgomery, 1988; Robinson, 1988; Moore et al., 1991; Kerin et al., 1992; Lambkin, 1992; Robinson et al., 1992; Golder and Tellis, 1993; Brown and Lattin, 1994; David, 1994; Brown and Eisenhardt, 1995; Kleinschmidt and Cooper, 1995; Calantone et al., 1996; Alves, 2013). The consensus in the management and accounting literature is that survival is dependent on achieving a fit between organizational strategy, structure, and management processes (Handy, 1985; Miles and Snow, 1992; Fisher, 1998; Abernethy and Lillis, 2001; Alves, 2013). Schumpeter (1939) defends, in his theory of Business Cycles, that there is a relationship between the entrepreneur and the innovation process, stating that economic development is generated by innovation that produces changes in the market, destroying and creating new business models, the which are driven by entrepreneurs. He also states, in his theory of economic development, that the emergence of new innovations are more economically viable than the old way of doing things, and that for this reason they lead to economic development, Schumpeter (1934). In this theory, the author emphasizes the "creative destruction" created by the replacement of old innovations by recent innovations, according to the same, all these innovations are driven by capitalism that stimulates

the emergence of new technologies created by innovative entrepreneurs who want to differentiate themselves from the competition by competitive advantage that new technologies offer their products. Innovation is defined as the invention (emerging from an idea), development (elaboration of that same idea) and implementation of new ideas (acceptance of innovation), Mokyr (1991). Sometimes invention and innovation are internally linked, as it is difficult to distinguish one concept from another. Although inventions can be carried out anywhere, such as universities, innovations occur mainly in the commercial sphere of companies (Fagerberg, 2013). Also, according to the same author, a company needs various types of knowledge to turn an invention into an innovation, to innovate it is necessary to know how to combine different aspects of knowledge, capabilities, skills and resources. Innovation and business performance have been heavily analyzed to date, and authors such as Adam Smith, Keynes, Karl Marx, Schumpeter, among others, seem to unanimously agree that innovation plays an important role for long-term economic development, Brite et al. (2009). According to Chaney et.al.; Brite et al. (2009), there are empirical analyzes that prove a consistent relationship between indicators related to innovation, such as Research & Development (R&D) and company performance. Mansfield (1962); Brite et al. (2009), consider that companies considered as innovative, present a higher sales growth than non-innovative companies and, in many cases, growth rates twice as high as the growth rates of non-innovative companies. Innovation is important in creating competitive advantage, Besanko et.al. (2000). Thus, according to him, this advantage comes from the ability of a company to know how to exploit opportunities created by market shocks, caused by the introduction of new products/services or similar products at lower prices. Brite et al. (2009) claim that innovation variables explain a relevant part of the variability in the growth rate of companies' net revenue. According to the same authors, "the positive relationship found between innovation and growth supports previous empirical studies, where Klomp and Van Leeuwen (2001) showed that companies considered innovative performed better in terms of sales growth and employment levels. than non-innovative, and that innovation contributes significantly to overall sales performance, productivity (as measured by the sales per employee ratio) and employment growth" (Brite et.al., 2009. p. 18).

### **3. RESEARCH METHODOLOGY AND QUESTION**

This section presents the methodology used in the quantitative part of the investigation, which aims to support the causal relationship between the culture of innovation and competitiveness. In terms of purpose, the investigation aims to understand whether both concepts are related and whether innovation is considered necessary and/or beneficial for the competitiveness of companies in the market in which they operate. In this context, the research seeks to answer the following research question: Is there a causal relationship between the culture of innovation and competitiveness in companies in the Leiria Region? In this way, the following hypotheses are presented, which are followed by the discussion of the main conclusions. The elaboration of the questionnaire was based on the entire literature review and had as starting point several articles and academic investigations. The structure of the questionnaire, with an estimated average duration of 5 minutes, has two sections: a part relating to the identification of the company and the characterization of the individual, in order to know their qualifications and what role they play in the company. In the second part of the questionnaire, 3 axes were chosen and addressed, inspired by the article by Dziallas and Blind (2019), which best represent innovation in an organization, according to the literature review, namely: Research and Development (RD); Innovation Sources (SI); Knowledge sharing (KS). For each axis, several questions were asked, 4 related to RD, 6 related to the SI and 5 related to the KS. The Likert scale was used with levels between 1 and 5, with 1 being "Totally Disagree" and 5 "Totally Agree".

At the end of the questionnaire, the companies' results are questioned, in order to represent their level of financial competitiveness, such as annual sales, EBITDA, debt, annual net income, among others. The survey was developed on the online platform “Google Forms” and was sent by email to the universe of companies classified on the top of the 100 largest and best companies in the district of Leiria and municipality of Ourém on July 22, 2021 + Edition 4401 of LEIRIA REGION. When preparing the questionnaire to be sent, there was a great focus on being brief and objective selecting direct and clear questions, all this in order to obtain information, generalize results and test the modelled hypotheses.

#### 4. DEVELOPMENT OF HYPOTHESES

Following the previous section, in which the basic aspects of the study were presented, at this point the modelled hypotheses are conceived. After the theoretical development of the various hypotheses, a modelled summary of the hypotheses formulated in this investigation is presented, substantiated with a representative figure of a first global model of analysis. The theoretical development of the different hypotheses allowed the referred to materialization in hypotheses, which were modelled with a view to allowing their subsequent quantitative test. Thus, a basic set of hypotheses was formulated at this point, incorporating the examination of possible positive relationships between: Innovation from the Research and Development indicator has a positive impact on the company's performance; Innovation from the Sources of Innovation indicator has a positive impact on the company's performance; as well as Innovation from the Knowledge Sharing indicator has a positive impact on the company's performance. Therefore, we try to test the following hypotheses:

- *H1 (a): Innovation from the Research and Development indicator has a positive impact on the company's performance.*
- *H1 (b): Innovation from the Sources of Innovation indicator has a positive impact on the company's performance.*
- *H1 (c): Innovation from the Knowledge Sharing indicator has a positive impact on the company's performance.*

Finally, the modelled summary of the hypotheses formulated in this investigation is shown in figure (1) below:

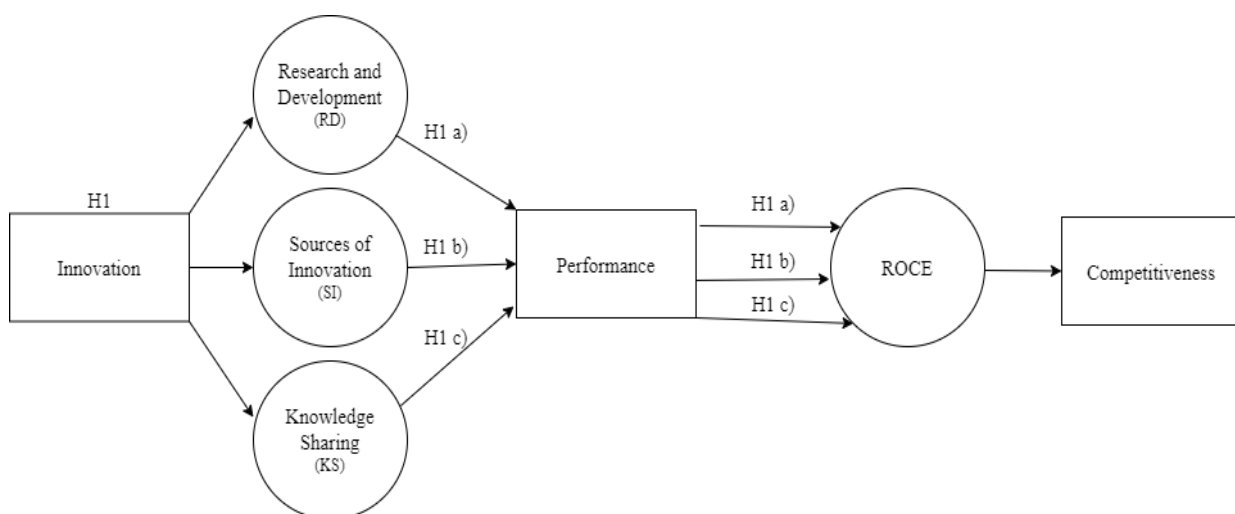


Figure 1: modelled summary of the hypotheses  
(Source: Self Elaboration)

The issues addressed were the following:

Question	Research and Development (RD)	Reference
RD 1	Research and Development activities are frequent in your company	Marisa Dziallas e Knut Blind (2019)
RD 2	There is an identified budget for Research and Development activities	Marisa Dziallas e Knut Blind (2019)
RD 3	Has your company launched more than one new product or service in the last 3 years	Marisa Dziallas e Knut Blind (2019)
RD 4	Your company implements actions to generate innovative ideas	Marisa Dziallas e Knut Blind (2019)

Question	Sources of Innovation (SI)	Reference
SI 1	Employees find it easy to participate in the creation of a new product/service within the organization	Marisa Dziallas e Knut Blind (2019)
SI 2	The company uses partnerships with external entities to create new product/service ideas	Marisa Dziallas e Knut Blind (2019)
SI 3	The company has mostly leaders who are open to change	Marisa Dziallas e Knut Blind (2019)
SI 4	The company collects and retains the ideas submitted by customers regarding product/service changes	Marisa Dziallas e Knut Blind (2019)
SI 5	Your company's managers dedicate a portion of their working hours specifically to innovation	Marisa Dziallas e Knut Blind (2019)
SI 6	In general, teams are flexible and quickly adapt to new customer needs	Marisa Dziallas e Knut Blind (2019)

Question	Knowledge Sharing (KS)	Reference
KS 1	It is easy in your company to transfer knowledge between employees	Marisa Dziallas e Knut Blind (2019)
KS 2	In the company there is training, both internal and external, on the innovation process	Marisa Dziallas e Knut Blind (2019)
KS 3	Managers are trained and guided by innovative methods and tools	Marisa Dziallas e Knut Blind (2019)
KS 4	Leaders and managers transmit working knowledge favorable to innovation	Neeta Baporikar (2014)
KS 5	The company invests in training its employees	Marisa Dziallas e Knut Blind (2019)

*Table 1: Issues addressed*

Through the answers obtained, it is possible to make a bivariate correlation between the innovation variables and the ROCE level of each company that participated in this study. By analysing their correlation, it is possible to know the relationship and influence that the innovation indicators present with the ROCE financial ratio, and consequently if innovation influences the competitiveness of the companies in this study. Overall, through the analysis of the data, 52 responses were obtained through the questionnaire, and in total 20 companies were analyzed that are part of the top 100 largest and best companies in the district of Leiria and municipality of Ourém of July 22, 2021 + Edition 4401 of LEIRIA REGION. This means that only 20% of the companies on the top 100 responded to the questionnaire. The largest number of responses obtained came from the automotive sector, plastics processing and the medical area, where the following senior staff stand out: commercial director, administrative area, financial director, service director, general director and team manager. Most respondents were aged between 41 and 56 years and were answered by 69.2% male and 30.8% female. Regarding the level of training of the individuals surveyed, most of them present a bachelor's degree and secondary education. Regarding the reliability of the data, so that they can be processed in the IBM SPSS software, it appears that the variables RD, SI and KS present at least a “good” level

of alpha Cronbach, according to the interpretation made by Hair et.al. (2016), mentioned by Nawi et.al. (2020), which ensures and guarantees the reliability of the variables representing innovation in this study, allowing us to move on to the correlations between the innovation variables and the ROCE financial indicator. The RD3 indicator was eliminated in the interpretation of the data in order to improve the reliability of the RD variable.

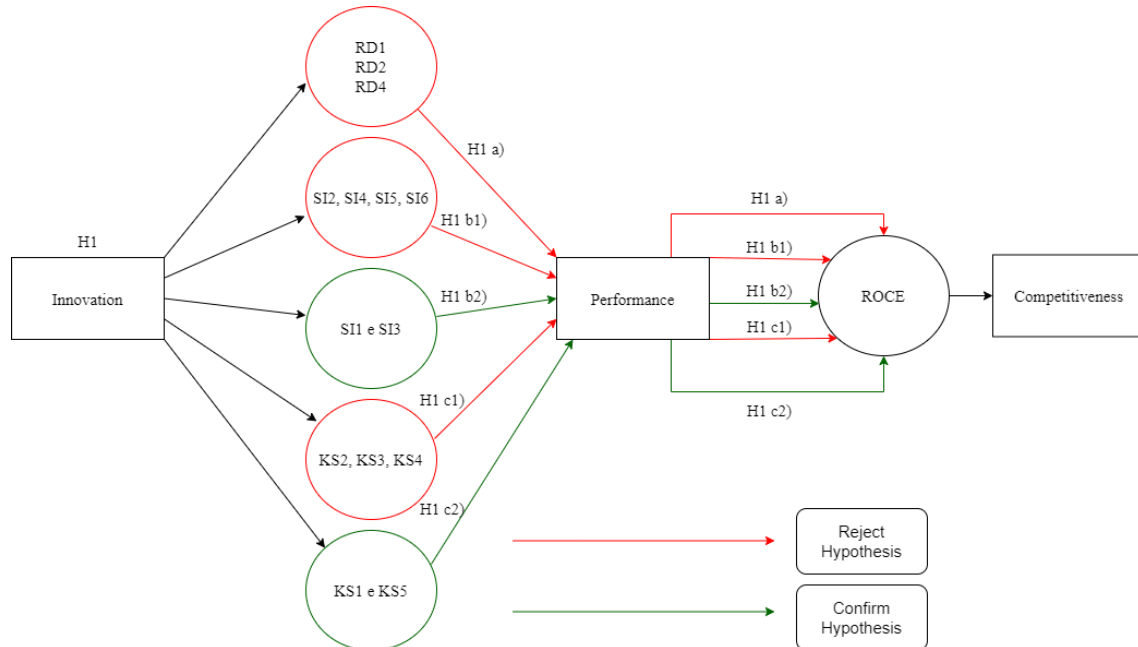


Figure 2: Interpretation of the data

## 5. DISCUSSION OF RESULTS

At this point, we proceed to the empirical and quantitative examination of the survey designed specifically to test the set of hypotheses presented above. It should be noted that construction was subject to a structuring that implied not only a readjustment of the initial analysis model, but also subsequent (re)adjustment tests, ie jointly considering not only the base data, but also its further statistical treatment, described in various sections of the section. Effectively, it should be noted that the process of constructing the variables is accompanied by the presentation of various descriptive statistics, in addition to the analysis by means of statistical inference. Regarding the collection of data from the sample collected for the study, as previously mentioned, 52 responses were obtained through the questionnaire, and in all 20 companies that appear on the top 100 were analyzed. Regarding the results of the correlations, according to the Spearman Correlation Coefficient, they did not show favourable results in all innovation variables. Only a few indicators confirm the research model's hypotheses.

The following hypotheses are confirmed:

- “H1 (b2): Innovation from the Sources of Innovation indicator has a positive impact on company performance” for indicators SI1 and SI3.
- “H1 (c2): Innovation from the Knowledge Sharing indicator has a positive impact on company performance” for indicators KS1 and KS5.

And the following hypotheses are rejected:

- “H1 (a): Innovation from the Research and Development indicator has a positive impact on the company's performance” for indicators RD1, RD2, RD4.

- “H1 (b1): Innovation from the Sources of Innovation indicator has a positive impact on company performance” for indicators SI2, SI4, SI5 and SI6.
- “H1 (c1): Innovation from the Knowledge Sharing indicator has a positive impact on company performance” for indicators KS2, KS3, KS4.

Based on the results obtained, only 4 of the 14 indicators addressed were positively significant, the remaining 10 showed no influence on the companies' ROCE. With these results, it is concluded that the RD had no relevance to the alteration of the ROCE, which is not in accordance with what was discussed in the literature review. This goes against what was initially intended to demonstrate: that research and development could positively influence the level of ROCE, and consequently its performance and competitiveness. One reason for reaching this conclusion may be the fact that the RD does not represent all the indicators related to this axis, only a small part of them, which did not prove to be significant in this study. Another reason may be that research and development initially incurs costs and expenses, which, within a year of analysis, can be misinterpreted. The results generated by RD are as a rule obtained in the medium term, that is, investments are made in year  $n$ , and their effects on results appear from year  $n+2$  or more, depending on the investment and the activity in question. Thus, these results can be justified by a certain lack of maturity in RD investments of the companies studied. Effectively, investment in R&D, in the short term, negatively affects results, because it increases costs and the inherent income will only appear later, as already mentioned. Thus, a negative or irrelevant relationship between RD and ROCE may reveal a lack of maturity in the RD bet, meaning that the companies in question either do not invest or invest on the short term, or invest occasionally on RD, but this is not a concern constant over the years. Another justification for the results has to do with the availability of information that only allowed us to analyze the impact of one year's innovation on the previous year's results (provided by the RL). Now, what would be recommended was a multi-annual study that could analyze the impacts of innovation carried out in year  $n$  on the results recorded from year  $n+1$  onwards. But for this we would need at least two years of investigation. Regarding the SI and KS, only part of them appear to be beneficial for the ROCE level of the companies that participated in this study. In the results of this study, only some of the indicators discussed are validated. Both the SI and KS axis have indicators that have not been shown to be significant. Those that demonstrate an increase in the companies' ROCE level and consequently their performance and competitiveness were SI1, SI3, KS1 and KS5. The higher these indicators are, the higher the ROCE level of the companies will be. This means that, for the 20 companies of the 100 biggest and best companies in the region of Leiria and municipality of Ourém, which participated in this study, the ease of participation that employees have in creating a new product/service (SI1), the opening for change on the part of leaders (SI3), the ease of knowledge transfer between employees (KS1) and how much the organization invests in training its employees (KS5), represent a whole set of innovation indicators, which has been demonstrated in this study, positively affect the ROCE level. This study confirmed that the aforementioned indicators contribute to the level of ROCE, and the greater the attention and focus of the companies on them, the greater the percentage of ROCE of the organizations, which improves and consequently their competitiveness in the market. Through the answers obtained in the questionnaire, and with the use of IBM SPSS Software, it is possible to make a bivariate correlation between the innovation variables and the ratios and financial indicators of the companies that appear in the top 100. It is possible to know the relationship that the indicators of innovation present with the ROCE financial ratio, and consequently whether innovation influences the competitiveness of the companies present in this study.

## 6. CONCLUSIONS

The realization of this study turned out to be quite enriching, as it allowed not only a greater knowledge about aspects such as the level of Research and Development, Culture of Innovation and Organizational Structure of a company and Knowledge and Competitiveness, but also factors that determine the success of the implementation and development of innovation. There is also an attempt to try to answer the starting question, which is much more generic than the hypotheses formulated for the survey. There is a convergence on the importance and concern of managers and academics in the area of management in order to determine which are the organizational determinants for success or failure, and the concern with innovation and the success of new products and services is fundamental (eg Maidique and Zirger, 1985; Robinson and Fornell, 1985; Lieberman and Montgomery, 1988; Robinson, 1988; Moore et al., 1991; Kerin et al., 1992; Lambkin, 1992; Robinson et al., 1992; Golder and Tellis, 1993; Brown and Lattin, 1994; David, 1994; Brown and Eisenhardt, 1995; Kleinschmidt and Cooper, 1995; Calantone et al., 1996; Alves, 2013). This study aims to understand the degree of importance that RD, SI and KS represent for innovation and for the level of ROCE of organizations. The results reveal that only some of the indicators addressed are validated, specifically 4 of the 14 indicators, were positively significant, the remaining 10 showed no influence on the ROCE of the companies. In this sense, the RD has not been shown to positively influence the ROCE level, and both the SI and KS axis have indicators that have not been shown to be significant. Those (4) that demonstrate an increase in the companies' ROCE level and consequently their performance and competitiveness were the following: SI1, SI3, KS1 and KS5, concluding that the higher these indicators are, the higher the companies' ROCE level. This means that, for the 20 companies of the 100 biggest and best companies in the region of Leiria and municipality of Ourém, which participated in this study, the ease of participation that employees have in creating a new product/service (FI1), the opening for change on the part of leaders (SI3), the ease of knowledge transfer between employees (KS1) and how much the organization invests in training its employees (KS5), represent a whole set of innovation indicators that positively affect the ROCE level. In this sense, it can be said that the greater the attention and focus of companies on the aforementioned indicators, the greater the percentage of organizations' ROCE, which improves their performance and competitiveness in the market. Thus, in this way, from a general perspective, there is a causal relationship between only some of the representative innovation indicators raised in this study with the competitiveness of the 20 companies in the top 100 of the largest and best in the region of Leiria and municipality of Ourém.

### 6.1. Limitations and Future Research

In the development of this study, several limitations emerged. One of the first limitations concerns the complexity of the concept of innovation itself, and it is difficult to represent it in the form of an indicator, since it includes many more aspects than those analyzed in this study. Also, the number of responses obtained was a difficulty in the development of this study. Most companies did not respond to the questionnaire, which limits the number of responses to be analyzed and correlated through IBM SPSS Software. Another limitation that arose was the fact that we were analyzing the results of the 100 companies that appear in the magazine's top 100, which only take into account one year of results, which derived from the pandemic period, where most Portuguese companies suffered a negative impact on the 2020 economy by COVID-19. In 2020, corporate debt grew by 1.6% compared to 2019, affecting sectors such as industry and commerce. ROCE is also a limitation in this study, as it does not always lead to the best decisions and may not provide a good picture of long-term profitability and because it does not consider risk factors in investments, Mcclure (2021). Also, a good ROCE level varies by industry and sector, what might be a good percentage of ROCE for one industry may not be



equally good in another industry or sector, Moneyweek (2018). As the period under analysis comes from a pandemic context and as only 1 year of results and the ROCE indicator were considered, in the 20 companies that participated in this study, a future research proposal would be to repeat this study in the future, to assess whether the results would lead to different conclusions.

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## **FAMILY AGRICULTURE, SUSTAINABLE DEVELOPMENT AND ETHNOGRAPHIC LINEAR PROGRAMMING - A REVIEW**

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### **ABSTRACT**

*Family agriculture (FA) is a diversified and multifunctional group both in ecological and socio-economic terms, representing around 90% of the farms, 53% of the agricultural land worldwide and accounting for 50% of the global agricultural production. However, FA faces some problems such as difficult subsistence, poor access to markets, rising production costs and climate change effects. These require urgent sustainable solutions, given the importance of FA as a source of livelihood and income to many poor families and its high contribution to the economic growth, the world food production and security. Fulfilling sustainable development goals (SDGs) and reducing poverty implies supporting FA in the improvement of its productivity, income, well-being of the households and resource maintenance. The challenge is to find ways to allocate the limited and often degraded resources available to different production activities, so to improve the farms' performances, maintain their specificity (productive, reproductive and communitarian functions) and their drive towards sustainability. This article represents a small contribution to overcoming this challenge. It performs an integrative systematic literature review on modeling the functioning of FA households from a sustainability perspective, through ethnographic linear programming (ELP). It also allows for the development of an inexistent body of literature that links FA, sustainability and ELP and allows the uncovering of new ways of thinking about FA (practices, policies, technologies, productive and reproductive activities and community social norms), and its pathways to reach sustainability. Ultimately, this study generates knowledge about the conceptual framework that is to be used and about the agenda for future research. The review methodology that was applied consisted of diverse steps, including the identification of the search terms and the accessed databases, the definition of the criteria for eligibility and exclusion of articles and the bibliometric analysis and review of the final list of the 46 selected studies.*

**Keywords:** *ELP, Family Farming, Literature Review, sustainability*

## **1. INTRODUCTION**

FA is a particular way of organizing work and production within the socio-economic context in which it operates (Schneider, 2016). It is diversified in size, technologies, market integration and ecological and socio-economic characteristics. FA is responsible for 50% of global agricultural production (Graeub et al., 2016; Lowder et al., 2016), 80% of the world food production and it occupies 53% of the agricultural land, including about 90% of the farms (FAO, 2014). Thus, it is an important contributor to economic growth and food security (Möllmann, Buchholz, Kölle & Musshoff, 2020) and it is understood as one of the main resources to solving hunger problems, as it can allow for an increase in the global level of food self-sufficiency among poorer populations (Paillacho et al., 2021). FA represents an important way of life and an agricultural work which is carried out by nuclei and family production units (Grisa & Sabourin, 2019). These units are responsible for most of the farms that exist in the rural areas of the planet and thus not only contribute to an important part of food production but also towards increasing sustainability, preserving and restoring biodiversity and ecosystems, while providing traditional and nutritious foods that promote balanced diets and preserve cultural heritage in rural areas (Graeub et al., 2016; Cavalli et al., 2020). Moreover, FA has a fundamental role in establishing populations, maintaining the landscape, structuring the business fabric and social and territorial cohesion in rural areas as well as in strengthening sustainable development (UN, 2011; Graeub et al., 2016; FAO, 2019; Palmioli, et al., 2020). Faced with a scenario of growing urbanization, the effects of climate change and an increasing concern with the future of natural resources (Preiss, Vaasconcellos & Schneider, 2018), there is a growing awareness of the key role played by FA and its needs to be further supported through public policies and projects. Although FA has acquired a prominent place in research and development agendas, supported by extensive fieldwork experience and a complex network of social actors linked to rural development (Deus, 2019), there are no studies that focus on finding ways to allocate its limited resources among different production activities, in order to improve the performance of the family productive unit, maintaining its specificity (productive, reproductive and community) and moving towards the achievement of the SDGs. This article attempts to fill the identified research gap and propose a research agenda, by carrying out a systematic review of the literature on FA and sustainable development (SD), from the perspective of the conceptual methodological tool of ethnographic linear programming (ELP).

## **2. SUSTAINABILITY IN FAMILY AGRICULTURE**

The application of the concept of sustainability in FA implies creating and improving efficient production models which promote social well-being and are not harmful to the environment (Silva et al., 2020; Silva & Torres, 2020). The author also refers the need for sustainability to consider structural and conjunctural aspects, without neglecting economic viability. To this end, Belmudes et al. (2021) defends the urge to combat the migration of young rural people (who are motivated by the lack of employment) and educate on behalf of responsible food choices with a positive effect on the systems and landscapes of family farming and the well-being of rural communities. This position simultaneously considers the three pillars of sustainability (Melo & Bellen, 2021; Moura et al., 2021). On the other hand, the vulnerable situation of FA in less developed regions and the lack of infrastructure and basic social and economic conditions, can be exacerbated by climate change (Maia et al., 2018; Torrent et al., 2021; and Tsiouni et al., 2021). Public and private policies are used in an attempt to mitigate this situation, these include, initiatives for granting credit, technical assistance, training human resources and strengthening social relations, market access and development of the value chain for local agricultural products, which can create employment opportunities (Carbonera, 2021; Chen et al., 2021; and Vieira et al., 2021).

Some of the means of transitioning to SD regard the creation of new mentalities and the adoption of consequent practices. These include agroecology and its certification (Pinto et al., 2017), whether it is associated with fair trade or not, the ecological footprint and the ecological, experiential and cultural tourism, which promotes circular economy business models (Fabron & Castro, 2019; Deus, 2019; Silva et al., 2020; Silva & Torres, 2020; Sow et al., 2021; Tamagno et al., 2018; Torres-Solis et al., 2020; and Yamanguchi, 2020).

### 3. METHODOLOGICAL PROCEDURE

The methodology used followed two main steps (Kahiya, 2018). The first step consisted of identifying the SCOPUS database due to its scope and wide use in similar reviews (Bisht, 2020; Belmudes et al., 2021; Amaral et al., 2021; Fabron & Castro, 2019; Carbonera et al., 2021; Chen et al., 2021; Costa, 2021; Deus et al., 2021; Melo & Bellen, 2021; Moura et al., 2021; Giagnocavo, 2018; Glazebrook & Opoku, 2021) and it also included the selection of the following search terms - "Family farming", "Ethnographic Linear Programming", "Sustainable development", "Productive, Reproductive, Community Activities". The second step was organized in two distinct phases and consisted of defining the criteria for eligibility and exclusion of articles. In phase I, both the language criteria (english, spanish and portuguese) and the time limit criteria (2017 to 2021) were used to uncover recent articles on the topic, following the recommendations of several authors (Amaral et al., 2021; Belmudes et al., 2021; Bisht et al., 2020; Carbonera et al., 2021; Fabron & Castro, 2019; Giagnocavo et al., 2018; and Krishnamurthy et al., 2017). This led to a sample of 127 articles. In phase II, according to Paul and Criado (2020), the titles, keywords, abstracts and full texts of each selected article were read. This procedure allowed for an exclusion of 81 articles which were not considered relevant. Thus, a final sample of 46 articles was attained, of which 34 articles focused on FA, 8 on FA and SD and 4 which were dedicated to the landscape environment, rural settlements, climate and production. This sample met the robustness criterion of literature review defended by Paul and Criado (2020), which should comprise 40 to 50 articles. For the bibliometric analysis of the articles, the software NVivo 12, Publish or perish (Harzing, 2017) and VOSviewer was used.

### 4. RESULTS

The organization and analysis of all 46 articles allowed for a set of results that are presented and discussed below. The search for word frequency bestowed a list of 100 words which were most frequent in the set of selected texts (figure 1). Of these, 10 words were identified as having the highest frequency according to the relevance of the topic. These were: (i) "farms" (farm, farm', farm", farmed, farming, farming', farms, farms', farms"), appearing 2749 times (70%); (ii) "familiar" (familiar, familiar, familiarity), appearing 1687 times (43%); (iii) "agriculture" (agricultural, agriculture, agriculture', agriculture"), appearing 1541 times (39%); (iv) "rurality" (rural, rurale, rurales, rurality), appearing 1415 times (36%); (v) "foods" (food, foods) appearing 1286 times (33%); (vi) "products" (product, product', production, productions, productive, productively, productivity, productivity, products, products') appearing 1226 times (31%); (vii) "socially" (social, sociale, sociales, socially), appearing 1159 times (30%); (viii) "develops" (develop, developed, developer, developing, development, development', developments, develops), appearing 937 times (24%); (ix) "systems" (system, systemic, systems, systems'), appearing 768 times (20%); (x) "economics" (economic, economical, economically, economics, economics), appearing 645 times (16%).

*Figure following on the next page*



In fact, most of the articles in the sample (29, of which 27 on FA and SD) were published between 2020 and 2021, with only 15 of the remaining 17 being dedicated to the FA and SD topics. Understandably, the less cited articles lie between the years of 2021 and 2020, with the exception of 2017. This study also found that the most influential article, both in terms of overall number of citations (n=13) and citations per year (6.50) was by Bisht et al. (2020). This article was followed by the work of Giagnocavo et al. (2018) and Ortiz et al. (2018), both with an identical number of citations (n=13).

Order Nr.	Articles	Quotes	Citations / Year
1	Bisht et al. (2020)	13	6.50
1	Giagnocavo et al. (2018)	13	3.25
1	Ortiz et al. (2018)	13	3.25
2	Niederle et al. (2019)	10	3.33
3	Toscani & Sekot (2017)	8	1.60
4	Reyes et al. (2020)	6	3.00
4	Maia et al. (2018)	6	1.50
4	Parodi (2018)	6	1.50
4	Krishnamurthy et al. (2017)	6	1.20
4	Teixeira & Pires (2017)	6	1.20
5	Mutea et al. (2020)	5	2.50

*Table 2: Top 5 of citation articles*  
(Source: Own elaboration with Publish or Perish software)

The geographical contexts of the research following Gilal et al.'s procedures (in press); Kahiya (2018); and Hungara and Nobre (2020), can be seen in Table 3. Most of the studies took place in Brazil (n=18), followed by Argentina and the United Kingdom (n=5), Colombia, Mexico and the United States (n=3), Chile, Greece, Italy, Japan, Portugal and Spain (n=2) and finally China, Germany, Kenya, Ghana, Senegal, Canada, Austria, India, Netherlands, Belgium, Pakistan, Switzerland, Tanzania and East Timor with fewer contributions from studies in the field (n=1).

Order Nr.	Geographical Context	Number of Studies	Order Nr.	Geographical Context	Number of Studies
1	Brazil	18	14	Belgium	1
2	Argentina	5	15	Canada	1
3	United kingdom	5	16	China	1
4	Colombia	3	17	Germany	1
5	Mexico	3	18	Ghana	1
6	United states	3	19	India	1
7	Chile	2	20	Kenya	1
8	Greece	2	21	Netherlands	1
9	Italy	2	22	Pakistan	1
10	Japan	2	23	Senegal	1
11	Portugal	2	24	Switzerland	1
12	Spain	2	25	Tanzania	1
13	Austria	1	26	Timor leste	1

*Table 3: Geographical context of the research*  
(Source: Own elaboration with VOSviewer software)

The themes addressed and presented in table 4, include sustainability (n=13), agriculture (n=9) rural sociology (n=7), environment (n=6), agrarian science (n=5), food (n=1), politics economics (n=1), pastoralism (n=1), agribusiness and environment (n=1), ecology (n=1), and geography (n=1).

Order Nr.	Context in Search	Nr. of Studies
1	Sustainability	13
2	Agriculture	9
3	Sociology Rural	7
4	Environment	6
5	Agraria sciences	5
6	Food	1
6	Politics economic	1
6	Pastoralism	1
6	Agribusiness and Environment	1
6	Ecology	1
6	Geography	1

*Table 4: Thematic context of the research*  
(Source: Own elaboration with Publish or Perish software)

The method review followed the perspective of Paul and Benito (2018), having found works that use case studies (n=18); qualitative methods (n=7); mixed - qualitative, quantitative and ethnographic - methods (n=9); empirical methods (n=2); and regression models (n=1). The data collection tools used in the application of these methodologies were structured interviews and questionnaires composed of open and closed questions as well as participant observation. In ELP, the construction of models is supported by quantitative and qualitative information collected through the application of a questionnaire to a sample of family farms and qualitative tools, such as interviews, participatory observation and focus groups. In the study where ELP was used (Deus, 2019) special attention was given to the use of available resources, division of labor among household members and its distribution and breakdown by each of its activities. Although requiring a large volume of information, of a qualitative and quantitative nature, the PLE proved to be an adequate instrument to model, in an integrated and realistic way, the set of productive, reproductive and community activities, taking into account the available resources and the needs of the various activities of agricultural households and pursuing objectives of social, economic and environmental well-being.

## 5. CONCLUSION

This study set itself with the purpose of filling the research gap and defining a research agenda on the subject of FA and SD. Its literature review, which combined 46 articles published in the last five years, allowed for specific conclusions, particularly for developing countries. It was found that FA contributed to several dimensions of sustainability, in part due to a large majority of rural agricultural households directly depend on it, but also because it relates to the management of natural resources and environmental preservation, the mitigation of climate change and the fight against poverty and hunger in the world, which are fundamental challenges to SD. The bibliometric analysis allowed the identification of the main research contexts within the scope of FA and SD, namely scientific journals, countries, topics and methodologies. It is thus concluded that there has been a growing interest in the subject, given the large volume of publications which were made in the last two years. These recent publications were the most cited. The main geographic contexts were Brazil, probably due to the breadth of the territory and the consequent relevance of FA and SD to its researchers.



The most relevant topic was sustainability and the dominant methodologies were case studies. Among the methodologies, the ELP was not the most used, probably due to the complexity of the modeling and the need for a large volume of information, but it seemed to be the one which allowed for an integrated approach to the various components of FA and the different dimensions of sustainability of rural communities. The absent use of this instrument showed that research still has a long way to go in order to overcome the problems and the vulnerability of FA in conjunction with DS. Given the importance of FA today, attested by international organizations, future studies can explore the role of family farmers as agents of change and of transition to SD. Another line of research can be directed towards identifying FA livelihood strategies that address climate change mitigation, social inclusion and poverty alleviation. The determinants that FA may have in creating sustainable opportunities for producers, territories and rural communities is an emerging topic in current research. FA could be an alternative way to rejuvenate the sector and fight migration and its social problems. Another line could be the development of a methodological approach adjusted to the context and specificity of FA, which balances objectives that can be contradictory, such as those of social, economic and environmental nature.

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## FINANCIAL LITERACY OF MICRO AND SMALL ENTREPRENEURS IN CROATIA

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### ABSTRACT

*Financial literacy is a core competency for all micro and small entrepreneurs, without which they cannot make the financial decisions needed in the day-to-day running of a business. The main aim is to examine whether micro and small entrepreneurs increase their level of financial literacy through additional external sources of information or informal education and which education channels they most often use. The 114 micro and small companies in Croatia were involved in the survey. The results showed that owners and managers at all levels are not investing enough in developing of their financial literacy using financial and taxes seminars like an informal channel of additional education.*

**Keywords:** *financial literacy, informal education, micro companies, small companies*

### 1. INTRODUCTION

Every entrepreneur must have specific knowledge for daily business decisions and running a business. The success of a company often depends on the ability of the manager. Managers need to make good decisions together with their associates to contribute to the company's prosperity. The manager's decision-making ability depends on his knowledge and experience, and his ability to understand and solve problems. A manager who does not have the knowledge and education is cannot to understand the information, especially financial reports, which is a basis of a decision. Drucker (2008) said that the only thing that distinguishes one company from another is the quality of its management on all organizational levels. That is because management represents the key function in the company. It is responsible for entire business success, to realise the vision, mission and execution of the its highest goals. Therefore, management must be well experienced and have broad knowledge, which depends on the few people gathered in management function. Owners and managers of micro and small companies need to invest more in their knowledge and develop their core competencies to survive in business. In Croatia, inefficient management (35.70%) is the leading cause of business failure (Roska, Bubić, 2012), especially in the small companies (40.6%), but a similar situation is in all other countries. Successful entrepreneurship also requires good financial literacy, especially in small and micro companies. In the European Union in 2021 (Clark, 2021), 22.6 million small and medium-sized enterprises (SMEs), with the vast majority of these enterprises micro-sized firms which only employed fewer than nine people and a further 1.3 million enterprises were small firms with between 10 and 49 employees. In Croatia (FINA, 2021), micro-companies were 89.5% and small companies were 9.1% in 2020. The categorization of enterprises in Croatia is carried out according to the Accounting Act (Narodne Novine 47/20) and the Small Business Development Encouragement Act (Narodne Novine 121/16). According to the regulations, minimum of two criteria need to be met from the three stated criteria for defining size of the companies.

The criteria are the number of employees, annual turnover or total assets. The number of employees is maximum 10 for micro and 50 for small companies. The main objective of this paper is to examine whether entrepreneurs in micro and small enterprises increase their level of financial literacy through additional education and which education channels they most often use. The research is conducted by survey of 114 micro and small companies in Croatia.

## 2. THEORETICAL BACKGROUND

Micro and small companies make up the majority of enterprises in the world, providing employment and contributing significantly to national incomes. For example, in Croatia (FINA, 2021), the micro and small companies employ 53.1% of employee and realise 36.8% of total revenue. Successful development and growth of MSMEs depend on supply- and demand-side factors, including adequate financial knowledge and skills (OECD, 2020). Financial literacy is core competency for all entrepreneurs. The definition of financial literacy of owners and managers of MSMEs and potential entrepreneurs is (OECD, 2020, p.4.) "the combination of awareness, knowledge, skills, attitudes and behaviour that a potential entrepreneur or an owner or manager of a micro, small or medium-sized enterprise should have to make effective financial decisions to start a business, run a business, and ultimately ensure its sustainability and growth. Financial knowledge refers to the theoretical and practical understanding of financial objects and concepts. The task of financial knowledge, as stated by Barbić and Lučić (2018, p. 2), is to provide an individual with data that will enable him to understand the equalisation of income and expenditure, understand methods of monitoring spending and other financial activities, understand the need for long-term planning, information and knowledge of where he can seek financial help when he needs it. To raise the level of financial literacy in Croatia, in 2015 the National Strategic Framework for Financial Literacy of Consumers for the period from 2015 to 2020 was adopted, which aims to create a basis for systematic and comprehensive integration of financial education into educational processes and bodies of local and regional self-government units, non-governmental organizations, financial institutions and others to actively participate in financial education. In accordance with the results of the research, the Ministry of Finance has developed a new National Strategic Framework for Consumer Financial Literacy for the period from 2021 to 2026 (Narodne Novine 68/2021), which lays the foundations for targeted improvement of financial literacy in the Republic of Croatia, to test the effectiveness of implemented programs and verifying the financial education of the population. Often, investors (Kiyosaki, 2017) pointed out the importance of the knowledge of financial statements for better financial literacy. Trombertta (2016), pointed out in his research that the level of financial literacy (financing and financial report) is quite low in a self-employed entrepreneur in Spain. In Portugal, the paper Mesquita et al. (2016) of financial literacy is research how important each one of the financial competencies such as digital literacy and access to financial information; basic math; budget; savings; indebtedness; credit and loans and consumer rights. In Malaysia, 60% of the researched respondents have a tax literacy (Latiff et al., 2005). A entrepreneurs have the highest incidence of error in filling tax return form, but their showed interest and were willing to spend time to learn about taxation. The paper of Atkinson (2017) has highlighted many challenges that impede the creation and growth of MSMEs including those related to their access to finance and low levels of financial literacy. Therefore, the most important things for all entrepreneurs are to support and improve their financial literacy level. The Micro, Small and Medium-size Enterprises (SMEs) sector has a crucial role to increase economic growth in emerging countries. The research of Buchdadi et al. (2020) of 70 people who managed the SMEs in Brebes district in Central Java found the positive impact of financial literacy, access to finance, and financial risk attitude on the MSME performance. This study also found the mediation role of access to finance and the financial risk attitude on the relationship between financial literacy on MSMEs performance.

### 3. RESEARCH AIM AND METHODOLOGY

This paper starts from the assumption that owners need to have the best financial literacy to run their business successfully. Some entrepreneurs got a financial education with their formal education, but it is not enough for today's business. All owners and managers need to improve their financial literacy through informal education. The research involved 114 respondents from 90 micro and 24 small companies. The statistical hypothesis for confirming the set aim is:

- H1: There are statistically significant differences between other positions in a company (owner, co-owner, director, chief and manager) in using the different source in information to increasing their financial literacy .
- H2: There are statistically significant differences between different positions in company (owner, co-owner, director, chief and manager) in using the other informal channel of education like seminars to increase their financial literacy .

The research was conducted based on a questionnaire by Miroslavić (2022), divided into three main parts. In the first and second part of the questionnaire defines the essential characteristics of respondents by gender, age, level of education, type of education, economic and finance subject in education, working experience, company size, number of employees, the average age of companies, as shown in Table 1.

		POSITION					TOTAL
		OWNER	CO-OWNER	DIRECTOR	CHIEF	MANAGER	
GENDER	MALE	30.12%	0.00%	33.33%	14.29%	83.33%	31.58%
	FEMALE	69.88%	100.00%	66.67%	85.71%	16.67%	68.42%
AGE	25-30 y.	19.28%	0.00%	20.00%	14.29%	0.00%	17.54%
	31-40 y.	36.14%	33.33%	40.00%	28.57%	33.33%	35.96%
	41-50 y.	30.12%	0.00%	26.67%	28.57%	50.00%	29.82%
	51-60 y.	12.05%	33.33%	13.33%	28.57%	16.67%	14.04%
	60 -	2.41%	33.33%	0.00%	0.00%	0.00%	2.63%
LEVEL OF EDUCATION	Lower ed.	22.89%	0.00%	40.00%	28.57%	16.67%	24.56%
	Hig school ed.	14.46%	33.33%	20.00%	42.86%	33.33%	18.42%
	Higher ed.	48.19%	66.67%	20.00%	28.57%	50.00%	43.86%
	Master's degree	14.46%	0.00%	20.00%	0.00%	0.00%	13.16%
EDUCATION	ECONOMY	43.37%	66.67%	46.67%	85.71%	33.33%	46.49%
	LOW	3.61%	0.00%	6.67%	14.29%	0.00%	4.39%
	INGENERING	7.23%	0.00%	20.00%	0.00%	0.00%	7.89%
	INFORMATIC	6.02%	0.00%	0.00%	0.00%	16.67%	5.26%
	OTHER	39.76%	33.33%	26.67%	0.00%	50.00%	35.96%
Finance education in formal education	YES	55.42%	100.00%	66.67%	100.00%	33.33%	59.65%
	NO	44.58%	0.00%	33.33%	0.00%	66.67%	40.35%
Working experience in the same or similar jobs	<5 years	26.51%	0.00%	26.67%	28.57%	0.00%	24.56%
	5-10 years	26.51%	33.33%	40.00%	14.29%	16.67%	27.19%
	11-15 years	12.05%	0.00%	6.67%	14.29%	0.00%	10.53%
	>15 years	34.94%	66.67%	26.67%	42.86%	83.33%	37.72%
Companies size	Micro	84.34%	66.67%	73.33%	42.86%	66.67%	78.95%
	Small	15.66%	33.33%	26.67%	57.14%	33.33%	21.05%
Number of employees	0	51.81%	0.00%	20.00%	0.00%	16.67%	41.23%
	<3	22.89%	66.67%	46.67%	28.57%	33.33%	28.07%
	<10	18.07%	33.33%	26.67%	14.29%	16.67%	19.30%
	<50	7.23%	0.00%	6.67%	57.14%	33.33%	11.40%
Average age of the company	≤2	30.12%	0.00%	26.67%	0.00%	16.67%	26.32%
	2- 5 years	28.92%	0.00%	20.00%	14.29%	0.00%	24.56%
	5-10 years	19.28%	0.00%	6.67%	0.00%	0.00%	14.91%
	>10 years	21.69%	100.00%	46.67%	85.71%	83.33%	34.21%

Table 1: The basic characteristic of respondents  
(Sources: Author's)

The survey included owners, co-owners, directors, department heads and managers of micro and small enterprises. Out of a total of 114 respondents, business owners make up 72.81%, which is good for this research because most business owners are people who make important financial decisions in the company. As persons who have the right to decide, the co-owners (2.63%) are associated with the owners, so together, they make up a share of 75.44%. The share of directors in the respondents is 13.16%, heads of departments 6.14%, and managers 5.26%. The study involved 68.42% of female respondents and 31.58% of male respondents. The largest share of respondents, 35.96% is the group 31-40 years, followed by the group 41-50 years with 29.82%. According to the level of education, out of the total number of respondents, the highest share of respondents is 43.86% with a university degree. 24.56% of respondents have a secondary school. The most represented finished their education is economics with 46.49%, followed by mechanical engineering with 7.88%, computing with 5.26%, law with 4.39%, and various other areas of education with 35.96%. In their formal education 59.65% respondent have acquired education in the field of economics or finance, while 40.35% of respondents have not acquired knowledge in these areas. Regarding work experience, the most respondents are 37.72% with more than 15 years of work experience. 31.23% are companies without employees and 11.40%, has up to 50 employees. The more than ten years in the business are 34.1% companies and less than two years in business are 26.32 % companies. The third part of the survey relates to the financial literacy of respondents and their behaviour towards finances in business. The questions were prepared using a Likert scale from 1 to 5, where 1 means “never” up to 5 with the meaning “the most often”. For the statistical analysis, this paper uses descriptive analysis and T-test and F-test analysis.

#### **4. RESEARCH RESULTS**

In the online survey participated 73% of owners, 3% of co-owners, 13% of directors, 6% of chief and 5% of managers. For the survey question for estimation of financial literacy, it was possible to achieve a maximum of 90 points and a minimum of 18 points. The average number of points of financial literacy for all participants is 66 (Miroslavnić, 2022) from maximum 90 points or 73 % of maximum points. The biggest number of points has co-owner and chiefs 71, then directors 68, owner only 66 and managers the lowest number of points 55. All variables in the research have Cronbach's Alpha greater than 0.9 representing very good reliability of the sample results. Those results pointed out that owners have not a better financial literacy than people in other positions in companies. Owners and managers on the all levels can increase their financial literacy through a different kinds of informal sources of information like as Business newspapers, Professional journals, Seminars, the Internet and Consultation with an external expert, as shown in Table 2.

*Table following on the next page*



		N	Mean	Std. Deviation	Std. Error	df	F	Sig.
Business newspapers	OWNER	83	2.06	1.193	0.131	4	2.079	0.089
	CO-OWNER	3	3.00	1.000	0.577			
	DIRECTOR	15	1.80	0.941	0.243			
	CHIEF	7	3.00	1.155	0.436			
	MANAGER	6	2.67	1.366	0.558			
	Total	114	2.14	1.189	0.111			
Professional journals	OWNER	83	2.64	1.436	0.158	4	1.508	0.205
	CO-OWNER	3	4.00	1.732	1.000			
	DIRECTOR	15	2.40	1.404	0.363			
	CHIEF	7	3.57	1.512	0.571			
	MANAGER	6	2.50	1.049	0.428			
	Total	114	2.69	1.440	0.135			
Seminars	OWNER	83	2.88	1.282	0.141	4	0.604	0.661
	CO-OWNER	3	3.33	1.528	0.882			
	DIRECTOR	15	2.87	1.457	0.376			
	CHIEF	7	3.14	1.464	0.553			
	MANAGER	6	2.17	0.983	0.401			
	Total	114	2.87	1.300	0.122			
Internet	OWNER	83	4.48	0.786	0.086	4	1.305	0.273
	CO-OWNER	3	4.67	0.577	0.333			
	DIRECTOR	15	4.53	0.516	0.133			
	CHIEF	7	4.71	0.756	0.286			
	MANAGER	6	3.83	0.983	0.401			
	Total	114	4.47	0.767	0.072			
Consultation with an external expert	OWNER	83	3.25	1.277	0.140	4	1.097	0.362
	CO-OWNER	3	4.00	0.000	0.000			
	DIRECTOR	15	3.67	0.900	0.232			
	CHIEF	7	2.86	1.345	0.508			
	MANAGER	6	2.83	0.408	0.167			
	Total	114	3.28	1.201	0.112			

*Table 2: Sources of information for entrepreneurs  
(Source: Author's)*

Internet is the most popular source of information and business newspapers rarely used in all positions in the companies. In a different positions on the all organizations level there is no statistically significant difference in the use of all sources of information to improve their financial literacy. According to the ANOVA F test in table 2 for all questions  $p > 0.5$ . Because of that, the first hypothesis “There are statistically significant differences between different positions in company (owner, co-owner, director, chief and manager) in using the different source in information to increase their financial literacy” is not confirmed. All entrepreneurs who need to refresh their knowledge or complete with some areas essential for doing business, informal education is a good channel. Seminars are one of the best to increase the business knowledge, especially financial literacy.

Seminars in the field of accounting, finance, tax, marketing, sales or business communication in the duration of one or several days allow entrepreneurs to refresh or complete their knowledge while running a business, such as in Table 3.

		N	Mean	Std. Deviation	Std. Error	df	F	Sig.
SEMINAR-ACCOUNTING	OWNER	83	1.89	1.230	0.135	4	0.463	0.763
	CO-OWNER	3	2.67	2.082	1.202			
	DIRECTOR	15	2.00	1.512	0.390			
	CHIEF	7	2.29	1.604	0.606			
	MANAGER	6	1.67	0.816	0.333			
	Total	114	1.94	1.285	0.120			
SEMINAR-TAXES	OWNER	83	1.90	1.216	0.133	4	1.100	0.360
	CO-OWNER	3	3.33	2.082	1.202			
	DIRECTOR	15	2.07	1.534	0.396			
	CHIEF	7	2.29	1.604	0.606			
	MANAGER	6	1.67	0.816	0.333			
	Total	114	1.97	1.293	0.121			
SEMINAR - FINANCE	OWNER	83	2.11	1.200	0.132	4	0.590	0.671
	CO-OWNER	3	2.67	1.528	0.882			
	DIRECTOR	15	2.07	1.438	0.371			
	CHIEF	7	2.57	1.397	0.528			
	MANAGER	6	1.67	0.816	0.333			
	Total	114	2.12	1.228	0.115			
SEMINAR-MARKETING	OWNER	83	2.65	1.338	0.147	4	1.514	0.203
	CO-OWNER	3	2.00	1.000	0.577			
	DIRECTOR	15	2.33	1.345	0.347			
	CHIEF	7	1.71	0.756	0.286			
	MANAGER	6	1.83	0.753	0.307			
	Total	114	2.49	1.298	0.122			
SEMINAR-SALES	OWNER	83	2.46	1.300	0.143	4	0.599	0.664
	CO-OWNER	3	2.00	1.000	0.577			
	DIRECTOR	15	2.47	1.302	0.336			
	CHIEF	7	2.00	1.155	0.436			
	MANAGER	6	1.83	0.753	0.307			
	Total	114	2.39	1.259	0.118			
SEMINAR-BUSINESS COMUNICATION	OWNER	83	2.59	1.326	0.145	4	0.838	0.504
	CO-OWNER	3	1.67	0.577	0.333			
	DIRECTOR	15	2.27	1.100	0.284			
	CHIEF	7	2.29	1.113	0.421			
	MANAGER	6	2.00	0.894	0.365			
	Total	114	2.47	1.257	0.118			

*Table 3: Entrepreneurs and seminars  
(Source: Author's)*

According to the information in table 3 entrepreneurs on all levels only sometimes or very rarely visited the seminars. The highest average score 2.49 got the marketing seminars. The entrepreneurs gave the lowest score 1.94 for accounting seminars and 1.97 for taxes seminars. According to the ANOVA F test in table 2 for all questions  $p > 0.5$ , that means, there is no statistically significant difference in the use of all sources of information to improve their financial literacy. The second hypothesis: "There are statistically significant differences between different positions in company (owner, co-owner, director, chief and manager) in using the different informal channels of education like seminars to increasing their financial literacy" is not confirmed.

## 5. CONCLUSIONS

Doing business in the global market is becoming more demanding and implies the high financial literacy of owners and managers at all levels. The results of a survey of 90 micro and 24 small businesses showed that owners, as well as managers at all levels, are underinvesting in the development of their financial literacy.

The Internet as a source of business information is still the most common source of business information. Seminars as an informal education to increase financial literacy are still not sufficiently accepted. Owners choose marketing seminar rather than taxes and finance. The limitation of this study that is small number of respondent and special circumstances of COVID-19 crises. The most important jobs of all entrepreneurs in COVID-19 crises, especially for micro and small companies are survive and save jobs. Owners and manager on all level in micro and small companies need to increase their effort in achieving better financial literacy if their in achieving better results and faster business recovery.

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# IDENTIFICATION OF MATERIAL STRUCTURES BASED ON THE FRACTAL GENERATION MECHANISM

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## ABSTRACT

*The article deals with the problem of identifying structures of materials based on the mechanism of generating fractals. The formulations of the problems of identification of structures of materials based on the concepts of dynamic chaos are formulated. Methods and algorithms for identifying structures of materials have been developed, and their effectiveness has been assessed using model examples and field data. The conclusion is made about the advantages of the approach using the fractal generation mechanism.*

**Keywords:** modeling, metal structure, positive feedback, fractal, fractal representations, steel 35HGSA

## 1. INTRODUCTION

Many recent studies indicate the fractal nature of the structures of materials [1-6]. The generation of fractal structures is based on the mechanisms of positive feedbacks [7]. At the present stage, the fundamental physicochemical regularities of the emergence and transformation of structures of materials have been developed and presented in such a form that it is difficult to use them for the synthesis of algorithms for controlling structures. In other words, they do not meet the requirements of models for control [8] - they do not reflect the dependence of the output actions on external factors. Therefore, it seems useful to follow the path of creating fractal models of structures, that is, identifying the structures of materials.

## 2. IDENTIFICATION OF STRUCTURES OF MATERIALS BASED ON THE SELECTION OF THE BEST FROM A GIVEN SET OF TYPICAL FRACTALS

One of the approaches to identifying structures of materials consists in choosing one or a combination of several of the best fractals from a given set of typical fractals [9]. In particular, one of the problem statements of this approach is:

Given:

Natural structures of materials:

$$St_j; j = \overline{1, J},$$

where  $j$  - the structure number,  $J$  - the number of structures.

A set of typical fractals:  $Fr_l; l = \overline{1, L}$ ,

where  $l$  - the number of a typical fractal,  $L$  - the number of fractals.

Material structure model:

$$St_j^M = \cup \{ Fr_l / S_{kl} \} + \varepsilon_j,$$

where  $S_{kl}$  - the attracting space (area) by the full-scale structure of  $l$  - typical fractal,  $k$  - the number of the attracting space,  $\varepsilon_j$  - the residual of the model.

Identification criteria:

$$Q_j = \sum_{k=1}^K S_{kl} \sum_{m,n=1}^{M,N} \left| \frac{St_j(m, n) - St_j^M(m, n)}{S_{kl}(m, n)} \right| \rightarrow \min,$$

where  $m, n$  - the number of points on the image of the structure,  $K$  - the number of attracting spaces.

Limitation:

$$M \in \overline{1, M^{\max}}, N \in \overline{1, N^{\max}}, K \in \overline{1, K^{\max}},$$

where  $M^{\max}, N^{\max}$  - the maximum number of points,  $K^{\max}$  - the maximum number of attracting spaces.

Required:

- 1) Determine the dimensions of the space  $S_{kl}$  for  $Fr_l$ .
- 2) Form a model of the structure from the combination  $Fr_l / S_{kl}$ .

The main disadvantages of this approach. Firstly, the need to form a set of initial typical fractals and, secondly, the resulting model does not reflect the dynamics of the structure of natural material.

### 3. IDENTIFICATION OF STRUCTURES OF MATERIALS BASED ON THE MECHANISM OF GENERATING FRACTALS USING POSITIVE FEEDBACK

A more preferable approach is based on the fractal generation mechanism, which is based on the use of positive feedback. In this case, the statement of the problem of identifying the structure of materials is as follows.

Given:

Natural structures of the material:

$$St_j; j = \overline{1, J},$$

where  $j$  – structure number,  $J$  – number of structures.

Mathematical record of the procedure for the formation of fractals, for example [10],

$$a) X_{n+1} = f(X_n) = X_n^2 + c,$$

$$b) X_{n+1} = f(X_n) = (1+r)X_n - rX_n^2,$$

where  $f(X_n)$  – function of transforming the current value of the fractal structure  $X_n$  in the subsequent meaning  $X_{n+1}$ ;  $c$  – parameter, a complex constant, and  $X_n, c \in \mathbb{C}$ ;  $r$  – the growth rate.

Algorithm for generating fractals:

$$Fr_l(r, c); l = \overline{1, L},$$

where  $l$  – number of math records.

Identification criterion:

$$Q_j = \sum_{m,n=1}^{M,N} |St_j(m, n) - Fr_l(m, n, c)| \rightarrow \min,$$

где  $m, n$  – the number of points in the image of the structure.

Limitation:

$$M \in \overline{1, M^{\max}}, N \in \overline{1, N^{\max}}, L \in \overline{1, L^{\max}},$$

where  $M^{\max}, N^{\max}$  – maximum number of points,  $L^{\max}$  – maximum number of math entries.

Required: define parameters  $r, c$ , minimizing  $Q$ .

The solution of the problem is carried out on model examples and for full-scale structures of 35KhGSA steel samples. The implementation was carried out in the high-level language C #.

In the model example, fractal structures with previously known initial coefficients were taken  $c$  and  $r$  (figure 1).



Figure 1: Fractal: a) with initial coefficients  $c_H = 0$ ,  $r_H = 1$ ; b) with initial coefficients  $c_H = 0$ ,  $r_H = 0,7$

As a result, for structure 1 a), the optimal values of the criterion Q are obtained with the values of the coefficients and equal to the specified ones. For structure 1 b), the optimal values of the criterion Q were obtained with the values of the coefficients and equal to the initial ones with a given accuracy  $\Delta Q$ . Moreover, the final estimates of the coefficients were found after repeated application of the search method from different search areas. When identifying the full-scale structure of steel 35 KhGSA using this approach, model images were obtained (figure 2), visually well reflecting the full-scale steel structures.

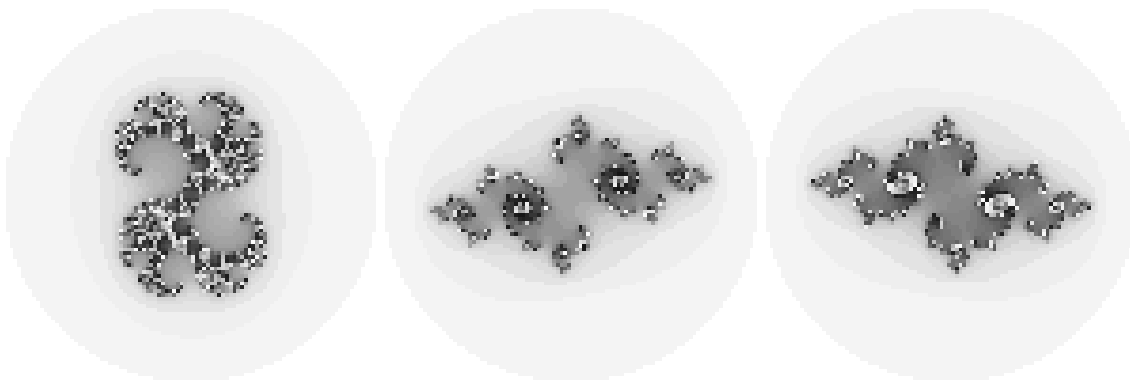


Figure 2: Images of model structures

#### 4. CONCLUSION

The estimates obtained by methods based on models of typical fractals and by methods with generation of fractal models are approximately the same. At the same time, the use of identification methods with the generation of fractal models is more preferable, since there is no need to select prefabricated fractal structures, which is also a difficult task to formalize. The presented identification method makes it possible to obtain a model of the structure of materials, which can be used in the construction of control systems with a predictive model, as well as directly for predicting the properties of materials.

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