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DEMOGRAPHIC AGING OF THE POPULATION – IMPLICATIONS ON THE LABOR MARKET

Brîndușa Mihaela RADU, PhD Associate Professor

Athenaeum University, Bucharest, Romania

bmradu@yahoo.com

Mariana BĂLAN, PhD Professor

Hyperion University Bucharest, Romania

dr.mariana.balan@gmail.com

Abstract: *One of the profound social and demographic challenges of contemporary society is the demographic aging of the population - an objective process resulting from the increase in life expectancy at birth and the reduction of fertility rates. This phenomenon covered most countries, especially the economically developed ones, having multiple implications on the economic, social, political, and cultural levels. Europe has the highest rate of demographic aging compared to other continents, and is considered to have already reached a critical stage. In the European documents, measures are provided to increase the legal and de facto retirement age and to increase the employment rate of the older adult population (50-65 years). Currently, at the level of the European Union, the median age is 43.1 years, but according to the latest estimates made by Eurostat, in 2050 the average age of Union citizens will be 49 years. This work wants to surprise what will be the implications of the demographic aging phenomenon on the labor market in the near future.*

Keywords: *demographic aging, labor market, population*

JEL Classification: *E24, J11, J18, J19, J21*

1. Introduction

Demographic aging is a process that refers to groups, collectives of people (and not to the individual as a singular case) in terms of the structure, composition of the population in relation to the “age” characteristic, and is a risk factor related to the evolution of the population and of its structure. At the same time,

population aging is a multidimensional problem: demographic, economic, social, political and cultural.

The demographic aging process is characterized by the increase in the proportions of adults and the elderly in a population, while the proportions of children and adolescents decrease, a characteristic fact for the reproduction of the narrow-type population and which leads to an increase in the median age of the population. A significant amount of scientific research is dedicated to the problems of population aging, its multiple consequences, as well as the demographic aspects and economic consequences of aging (the impact on the labor market, the pension system and the social assistance system for the elderly). The causes that explain the aging of the population are the decrease in the birth rate, advances in medicine and the increase in the standard of living, which increase the numerical growth rate of the elderly population by reducing morbidity and mortality.

2. Theoretical approaches

The migration flow, having a double meaning, can contribute to the deepening of demographic aging, or vice versa - it leads to the rejuvenation of the population. The demographic process around the globe is determined by two basic patterns:

1) the “elderly population” model, which corresponds to areas with a low level of birth and infant mortality and, respectively, with a higher level of life expectancy at birth;

2) the “young population” model, which is valid for areas with high birth and mortality rates, including infant mortality, with increasing natural growth, as well as low life expectancy at birth. The aging of the population is considered mobile, when the share of people over 60 constitutes 12 - 14% in the total population; stable, with the share of people of this age at the level of 15-19%; the aging of the population causing depopulation, with the share of people aged 60 and over 20%.

Demographic aging is a firm and long-lasting process, which, once established, continues its evolution in the sense of its emphasis. The analyzes and studies carried out at a given moment have a limited value and their conclusions are valid for not too long periods, a fact that convinces that aging is a process of both actuality and perspective. The aging of the population, as a phenomenon, constitutes a challenge not only as a biological process, which takes place at an individual level, but also as a social phenomenon, with an impact on all sectors, such as public finances, social-economic policy, the labor market, infrastructure, social relations, and so on.

The increase in life expectancy, as a determining factor of population aging, is linked to success in medicine and economics, in particular it is due to the improvement of living conditions, the modification of the morbidity structure and the reduction of the impact of external factors on mortality. Life expectancy is a “barometer of social progress”³, but its extension is a reflection of living conditions, working conditions, food, habits, environment, health and education. The aging of the population has a socioeconomic importance and a significant impact both on society as a whole and on the elderly, in particular, a positive assessment of the elderly and their role in society contributes to the progress of the economic potential and favors the effective and comprehensive integration of the elderly in society.

According to the demographic aging scale of J. Beaujeu-Garnier – E. Rossett, the aging threshold is determined at the age of 604. Taking this criterion into account:

- countries where the share of people aged 60 and over, in the total population, is less than 8%, are classified, from a demographic point of view, as “young” countries;
- countries in which the share of this group varies between 8-12% are characterized as countries in the “pre-aging” period;
- countries with a 12% or more share of people aged 60 and over are classified as “aged” countries.

With reference to the countries in the “aged” group, the classification of the level of aging is as follows:

- the “initial level of aging” in the case of the share of the elderly between 12-14%;
- the “average level of aging” in the case of the share of the elderly between 14 -16%;
- “advanced level of aging” in the case of the share of the elderly between 16-18%;
- “very high level of aging” - in the case of the share of the elderly over 18%.

At the same time, according to J. Sandberg’s classification, the determination of the level of demographic aging is carried out based on the changes that appear in the structure of the three main age groups: 0-19 years, 20-59 years, 60 years and over. According to J.Sandberg’s scale, the aging of the population is manifested when the share of people belonging to the first age group (0-19 years) is less than 30%, while the share of people from the third group (60 years and over) exceeds the 15% level. So, the main indicators that

characterize the demographic aging of society are the number of the population aged 19 and the number of the population aged 60 and over.

In the age structure of the population, demographic aging is manifested by: the aging of the “bottom” population, in the case of low fertility (A. Boiarski, Russia, Jean Bourgeois-Pichat and A. Sauvie, France; Ansley Johnson Coale, USA, etc.), and aging “from above”, as a consequence of the reduction of mortality in the elderly and in the category of the elderly, which is a result of advances in the field of medicine, and, therefore, the increase in life expectancy. Thus, the reduction of mortality contributes to aging in the following cases: more people reach old age and the life expectancy of the elderly increases.

The demographic aging process of the population has multiple consequences in the social, economic, political, cultural, etc. fields. Thus, in the economic field, this process can have an impact on economic growth, investments, savings, the labor market, the change in the structure of consumption. In the social field, the aging of the population has an impact on the change in the composition of the family, the standard of living, the demand for housing, social and medical services, education, pension insurance, etc., and in the political sphere - on the results of the elections, the system of political representation, etc. The analysis of the process of quantitative and qualitative changes in the structure of the population is a necessity for the development of programs, which include directions of a social and economic nature, as well as for making decisions in the field of health care, education, social security, employment, etc.

Demographic aging is an almost global phenomenon that faces, or threatens to affect, all countries at a more advanced stage of development. It appears against the background of the decrease in the birth rate of the population, doubled by the increase in life expectancy. It is a phenomenon that begins to raise problems after a rather long interval since its appearance, and for this reason there is a risk of not treating it with sufficient seriousness. And the reverse is true, from the moment the population starts growing again, the effects of population aging take a long time to disappear. The implications of this phenomenon are multiple, in many spheres of economic and social life, but in this chapter only the effects on the labor market will be discussed.

The implications that the aging of the population has on the labor force is a less publicized topic, although as will be seen they are multiple, but they are more difficult to quantify. Population aging implies a reduction in the number of young people, we are mainly referring to people aged between 15-29, who enter the labor market, and who are the future workforce, which in fact boils down to the reduction of the workforce, under conditions of constant participation rates. The aging of the population actually also means an aging of the labor force, which has implications in the field of qualifications, as well

as the expenses for the continuous training of employees. Demographic aging also affects labor costs, as there is a positive correlation between age and salary, which implies an increase in average salary only due to the increase in average age. On the total economy, this implies an increase in the expenses with wages, so in the unit costs, in the conditions of similar productivity of the two categories of labor force. These topics will be detailed below.

In this work, it is aimed to highlight the effects that the aging of the population will have in the future on the available labor force.

3. The effects of population aging on the labor force in Romania

In the case of Romania, the aging of the population is a very serious phenomenon, for several reasons, first of all due to the fact that in our country the phenomenon of demographic decline has been established for a long time, and secondly, the budgetary implications are more serious, especially due to the poor representation of the pension/health system alternative to the state one. The year 1990 is the moment when Romania's population began to decrease, a decrease accelerated in recent years by the phenomenon of external migration and the sharp decrease in the birth rate.

Table 1 presents an evolution of Romania's population, and based on this evolution, a whole series of future projections of the population number were penciled, projections that are not very gratifying.

Any population forecast is based on a series of assumptions related to the value of some rates related to birth, mortality, life expectancy, by age category, therefore they must be taken as informative, and may be disproved by the subsequent demographic evolution in the case of some rate developments not anticipated by the respective forecast. Having said that, the differences between different forecasts are not very substantial, especially from the point of view of long-term trends.

Table 1 The demographic evolution of Romania's population

| | 1990 | 2005 | 2010 | 2019 | 2020 | 2021 | 2022 |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Total | 23211395 | 21382354 | 20294683 | 19425873 | 19354339 | 19229519 | 19042455 |
| 0-14 years | 5508479 | 3735907 | 3206067 | 3056051 | 3058900 | 3056590 | 3089023 |
| % of the total | 23.7 | 17.5 | 15.8 | 15.7 | 15.8 | 15.9 | 16.2 |
| 15-29 years | 5229133 | 4972314 | 3829423 | 3180455 | 3083637 | 3042004 | 2951926 |
| % of the total | 22.5 | 23.3 | 18.9 | 16.4 | 15.9 | 15.8 | 15.5 |
| 30-49 years | 6072530 | 6047504 | 5920312 | 5779333 | 5714156 | 5613516 | 5404506 |
| % of the total | 26.2 | 28.3 | 29.2 | 29.8 | 29.5 | 29.2 | 28.4 |

| | 1990 | 2005 | 2010 | 2019 | 2020 | 2021 | 2022 |
|--------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 50-64 years | 4017818 | 3600473 | 4064182 | 3814553 | 3837104 | 3814273 | 3890679 |
| % of the total | 17.3 | 16.8 | 20.0 | 19.6 | 19.8 | 19.8 | 20.4 |
| 65 years and over | 2383435 | 3026156 | 3274699 | 3595481 | 3660542 | 3703136 | 3706321 |
| % of the total | 10.3 | 14.2 | 16.1 | 18.5 | 18.9 | 19.3 | 19.5 |

Source: INS, Tempo-online database, <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>

The age distribution between women and men is quite different, thus, although the total number of women is higher than that of men, at ages up to 50, men are more numerous, the situation changing for older ages. In the conditions of the predicted demographic changes, it is interesting to see what the effects are on the workforce. Most obviously, demographic aging will affect the workforce quantitatively, as participation rates are different for different age groups.

As can be seen from table 2, the 35-44 age group has the highest participation rates, with over 80% of the active population. At the opposite pole is the population over 65 years old, which has participation rates of 11.9%. The population aged 55-64 also has low participation rates, at approximately 38%. As the aging of the population reduces the population aged up to 45, which has the highest participation rates, in the long term a de facto decrease in the labor force will also be observed at unchanged participation rates.

In the context of a fairly low unemployment rate in Romania, the only reserve to at least maintain, if not increase, the number of employees remains the increase in participation rates. And from this point of view, the objectives of the Lisbon Agenda to obtain participation rates of 70% for the working-age population, as well as participation rates of 60% for women and 50% for the elderly. In the long term, when the participation rates for people up to the age of 45 cannot be increased, there will be a substitution of the young labor force with the older labor force.

Table 2 Participation and employment rates of the population by age category, in 2022

| | Activity rate | Occupancy rate |
|---------|---------------|----------------|
| Total | 51.8 | 50.5 |
| 15-25 | 27.8 | 22.0 |
| 25-34 | 80.2 | 75.0 |
| 35-44 | 84.6 | 80.1 |
| 45-54 | 79.8 | 77.2 |
| 55-64 | 39.4 | 35.1 |
| over 65 | 11.9 | 9.8 |

Source: INS, Tempo-online database, <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>

In this context, we must identify the effects that population aging has on the availability of labor in Romania, in order to study how affected it will be in the medium and long term. However, this can only be studied under the conditions of some assumptions related to the various participation rates of the different age categories. Table 2 presents the participation rates of the various age categories at the level of 2022, the most recent year for which the respective data exists.

4. Conclusions

The aging of the population strongly influences the labor supply. A series of measures are becoming necessary now and in the next period, for the labor market. They look at several aspects:

- Reforms that generate employment and growth rates will allow better resistance to the pressure of population aging and to maintaining the level of social benefits in Europe. Extending active life is a response to a major political challenge. The promotion of an active old age of the population, the postponement of retirement, calls for changes in attitude on the part of elderly workers, but also on the part of entrepreneurs (regarding, for example, the conversion of the elderly workforce).

- Favoring a transition between work and retirement, in favor of a progressive withdrawal.

- Women are, in the future, the main source of growth of the active population. The aging of the active population poses problems related to equal opportunities between men and women, progress in dividing roles and responsibilities in the family.

- The integration of the inactive (women, unemployed) into activity and the reduction of retirements can alleviate, temporarily, the reduction of the labor force. The concentration of the unemployed among the less skilled and less competent indicates that, in a culture of technological progress, a labor shortage can coexist with a significant number of unemployed.

- The early retirement system proved ineffective and very costly for society. The retirement of elderly workers was operated at the price of long-term public financing. Early retirement policies benefited the private sector, which restructured and reduced the workforce without replacing older workers with younger ones.

- Current retirement age policies need to be reviewed. An increase in the retirement age has a positive effect on public spending and allows maintaining the job offer in the following decades.

– Work methods must be reconfigured for all age groups, within a global policy regarding work, family, social protection, retirement.

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THE SUPPORT GIVEN BY DATA ANALYSIS IN THE DECISION-MAKING PROCESS IN INTERDEPENDENT ECONOMIC SYSTEMS

Dănuț-Octavian SIMION, PhD Associate Professor
Athenaeum University, Bucharest, Romania
danut_so@yahoo.com

Abstract: *The paper presents the support given by data analysis in the decision-making process in interdependent economic systems. There are situations when solving the problems that arise in the performance of a company's activity involves the operative processing of data and obtaining useful information in substantiating decisions. A well-founded decision requires internal and external information, expressive indicators that reflect the processes and phenomena of the company's economic and financial activity, determine the limitation of the uncertainty that characterizes the company's behavior in the context. Together with the information, in identifying and choosing the courses of action, an important role is played by the rigor and personal experience of the decision-maker, because in the last instance, decision-making is an attribute of management. Built to assist the decision-maker in making decisions, interconnected economic information systems ensure the acquisition, analysis and interpretation of a large volume of information, helping managers to make quick decisions, Decision-makers thus have the opportunity to analyze a large number of possible solutions, to build several analytical and intuitive models for evaluating the results. Within the decision-making problem, specialized computer systems start from daily information about the economic environment, ensure their selection, interpretation and compaction to prepare the decision. Instead of multiple calculations, which provide inopportune information, sorting, selection, classification and evaluation operations are carried out, intended to organize the information, reduce uncertainty, lead to recommendations and options for action. Economic decisions must take into account the external environment specific to business, but must be based on historical data previously entered by a commercial company, valuing the rules and knowledge accumulated over time.*

Keywords: *decision-making problems, specialized computer systems, data from external environment, historical data, economic decisions, analysis and interpretation, expressive indicators*

JEL Classification: *C23, C26, C38, C55, C81, C87*

1. Introduction

In the economic field, there are computer systems built to assist the decision-maker in making decisions, which ensure the acquisition, analysis and interpretation of a large volume of information, helping managers in making quick decisions. Decision-makers thus have the opportunity to analyze a large number of possible solutions, to build several analytical and intuitive models for evaluating the results. In the competitive economic field, information systems for decisions help the analyst to establish a diagnosis on the present and the future of the firm based on data extracted from a source of accounting information. Considered a computerized documentation system, based on knowledge in the financial-accounting field, it helps the decision-maker to solve problems related to the analysis of the existing patrimonial situation, the conditions of financial balance and profitability, to highlight weak points and strong points, to make forecasts.

The analysis is mainly based on the information provided by the balance sheet, the profit and loss account and appendices, supplemented with information on the commercial, technical and human potential, with information highlighting the company's position on the market and the intensity of the competition. In the interconnected economic field there are no unique decision criteria, the elements of the result being sensitive to a multitude of factors, to assumptions regarding prices, the market, or economic growth. For example, a cost-effective solution from the point of view of general liquidity may be less good from the point of view of the treasury.

The accounting information is correlated with the specifics of the activity, with the results of exploitation or with the objectives established depending on the context. Thus, the interpretation of financial flows is done in a different way in the phases of expansion, maturity or decline of the company (Helversen et al., 2018; Kim et al., 2008).

The results of the financial analysis are obtained most of the time on mathematical models. They are subordinated to some general objectives, they are useful in formulating general economic policy recommendations. I am looking either to improve the framework necessary for making decisions, or to carry out a preparatory study to make a decision.

Theoretically there are several models for the same situation. The decision-maker, specialist in financial analysis, remains the last mediator who, interactively and depending on the context, performs calculations within the offered models, changes the representation model if necessary. Success is essentially based on the ability of the decision-maker to foresee events and to anticipate the consequences of their production.

2. Models and techniques used in the decision-making process with economic data in the foreground

In the general framework of the company's IT system, IT systems for decisions are included in the category of management systems. It is based on information from transaction processing systems and assists the managerial process at different decision-making levels. They extend towards the implementation of the decision, the orders resulting from the decomposition of the decisions reaching the level of the management system.

Used in the management of the company, Interactive Decision Support Systems are present in various stages of the decision-making process; at the tactical or strategic level they emphasize the flexible elements, assisting ad hoc requests and analysis. Data-driven ones respond in real-time to planned or unplanned requirements. Model-based ones provide solutions for a specific decision or a set of related decisions.

Unlike them, managerial IT systems provide periodic standard or exceptional reports, depending on predefined criteria, to cover the informational requirements of a functional department (Borrero-Domínguez & Escobar-Rodríguez, 2023; VanDerHorn & Mahadevan, 2021).

Transactional systems are designed to streamline and automate the processing, record keeping and reporting of transactions. Record current information and maintain database of transaction information. The quantitative and even qualitative increase in the information obtained from the processing of daily transactions did not lead to significant changes in the quality of the decisions made. There are numerous options for data processing, information evaluation, and adaptation to changes.

While transactional systems emphasize the integrity and consistency of data, being managed as a whole, interactive decision support systems regroup data spread across several databases according to a defined purpose, manage data organized distinctly by analysis subjects.

Broken down by operational departments, the decisions are found in directives necessary for operational management and take into account the particularities of the functional departments. The simulation is done on models

of the field of application and facilitates the decision-maker's choice of measures imposed by reality, by the concrete conditions in which the activity is carried out (Pouyan, 2023; Zhang et al., 2023).

Presented and sometimes even used independently, management systems make up a unitary system at the company level. Integrating specific information and communicating at different managerial levels, based on the data recorded in the primary documents, they build decisions for the entire company.

The decision-making process and the adoption of the decision

The substantiation of the decision is related to the establishment of objectives and the allocation of the necessary resources. It is done through analysis and simulation, with the participation of several elements: 1. the decision-maker, represented by a person or a group of persons. End user of the decision-making process, adopts the right solution based on acquired knowledge and accumulated experience. The decision maker structures information needs and standardizes data analysis procedures, it streamlines the structuring of incremental problems, the individual exploitation of the set of decisional alternatives modifies, depending on the data and the context, the sequence of operations that is not known in advance, communicate results easily The only component with which the user works directly, the interface subsystem, must give the decision-maker the feeling of a direct manipulation of information, facilitating creativity and associative thinking, stimulating the ability to formulate different alternatives in poorly structured conditions. The visual interactive system allows him to develop individual strategies through the flexibility it provides, through the set of intuitive tools available for modeling and analysis (Kim et al., 2008; Pouyan, 2023).

The decision-maker builds his own information system, which will allow him to solve in real time the problem subject to the exceptional process. The inputs to the decision-making process are represented by data, decision variables, models, restrictions that limit possible solutions, similar decision-making situations. The input data in a decision-making process comes from internal and external sources, from several databases, managed in different programming environments. They must be filtered, tested and consolidated in order to fulfill the objective of generating suitable indicators and ah-hoc reports to assist the decision. In the case of building some models, the adoption of the decision is based on much more comprehensive information than that provided by reports and economic indicators. Mathematical or quantitative models are embedded in a model database, managed by a model management subsystem that separates users from the physical aspects of data processing and storage, extract, create, delete or modify models.

The decision-making process, carried out with the help of specific tools, methods and techniques, of scenarios built according to a defined purpose. Interactively, it replaces the classical, procedural execution with a decision-maker-directed execution according to the stages of solving a decision-making problem. Input coordination is done in most cases with software systems specialized in creating an analytical database, or with model building languages. In the first case, the user is provided with personalized views of the stored data by performing a diverse set of operations on the transactional data. The methodological approach starts from the data analysis to the extraction of information from the data and the obtaining of knowledge for the decision-making process. In the second case, for a specific problem highlighted in a model, one of the most used tools in the decision-making process, simulation, is used. Followed by optimization and forecasting, simulation assists the user in running complicated models, highlights the resulting variables whose value analysis leads to the adoption of a decision (Helvesen et al., 2018; VanDerHorn & Mahadevan, 2021).

The outputs from the decision-making process are represented by analytical indicators that reflect the performance of the analyzed system, result variables, evaluation criteria or implementation plans. The evaluation of the results depends on the search method; the presentation of the results depends on the facilities offered by the dialogue component with the users. In addition to maintaining traditional information representation formats (graphs, maps, and diagrams) today, new types of dynamic graphics are used for multidimensional data representation. A simple dialog interface with the entire company is used, which allows connectivity and communication between networks with different topologies.

Types of decisions

In the economic field, depending on the time horizon, the level at which they are applied and the aspect under which the transformation of resources into results is viewed, decisions can be classified into:

- Strategic decisions, for long periods of time (4-5 years). It aims at objectives, resources and managerial policies. For their substantiation, along with internal information, external information is also taken into account, highlighting the company's connection with the external environment. They are related to the diversification of the activity, to new products, to the development of the position on the market.

- Tactical decisions, for periods between six months and two years. They are characteristic of the functional departments and are found in the forecast of the production plan, the acquisition and use of resources.

- Current (operational) decisions, for periods of up to several months. They look at obtaining the maximum profit from current exploitation and aim at fixing prices, promoting sales, allocating resources for research, development, and marketing.

Depending on the degree of structuring, decisions can be classified in:

- Structured (programmable) decisions, adopted in the case of problems for which there are solving algorithms. Being described by a fixed program, the decision-maker's contribution is determined more by his experience than by creativity and inventiveness. They are used in routine activities: commercial management, invoicing, calculation of indicators, accounting analyzes and those in the personnel-salary field.

- Unstructured (non-programmable) decisions for which there are no predetermined procedures, appealing to the decision-maker's intuition. It is adopted in exceptional or novel situations, based on models incorporated in a model base. The elements of the decision are more qualitative, the action option being chosen from information organized to reduce uncertainty.

- Semi-structured decisions, in which case it is possible to resort only partially to known procedures. The decision has predominantly quantitative elements, the objectives not being precise. This is the case of investment or financing decisions (Kim et al., 2008; Zhang et al., 2023).

The structuring depends on the complexity of the situation, on the restrictions inside the company or from the external environment, on the level of knowledge and experience of the decision-maker. The degree of structurability decreases as the decision-making level increases. Moreover, it can change over time, placing a decision in one class or another depending on the qualities of the decision-maker, on the accumulation of experience.

In the attempt to structure the decision, possible similar cases are checked, a solution space is built, the best forms of representation of the respective problem are found. According to some authors, decisions are structured when the formulation of the problem and the possible actions are found in a model. Herbert Simon even stated that "modeling is the structuring of unstructured problems". As an example, payment and collection are structured based on accounting models, supply and sale through operational research models. On the other hand, granting a loan for the client is a poorly structured decision, because there are no representations capable of evaluating the client's ability to pay, there is no analysis model that quantifies the creditworthiness, solvency and quality of the respective client.

The phases of the decision-making process

The complex process of knowing the real system, designing a decision-making model and choosing the best decision is divided into several phases. These phases take place sequentially, but leave the possibility of returning to the previous phases. Following an analysis of the results obtained and their reporting to the proposed objectives, differences are signaled and problems are identified that reveal the need to take action. In order to solve them, we try to fit them into a certain category, a fact that determines the approach to the problem through a standard method. Through additional information, the factors that determined the deviation from the expected result are selected and the importance they have in the context is appreciated. In complex cases, the problem is broken down into subproblems, easier to approach, easier to structure. The solution is the result of communication between all the decision-makers, who share responsibilities both at the level of the general manager and at the decision-making levels corresponding to the defined sub-problems (Helvesen et al., 2018; VanDerHorn & Mahadevan, 2021).

The result of the information stage is a formal description of the identified problem, the category it belongs to and the responsibilities involved. For example, after the first phase, the decision-making sphere can concern the excessive expenses in a functional department, too high stocks or even the adoption of a research and evaluation project regarding the introduction of the computing technique. In the classification stage, it is established that the problems of excessive expenses or the problem of too high stocks are structured problems, because there are models for choosing a level of stock for a certain product (expenses) in the conditions of the existence of a constant demand, while the adoption of a project of research and evaluation regarding the introduction of the computing technique is an unstructured problem.

The establishment of responsibilities takes into account the fact that, in the reduction of expenses, the personnel policy under the given conditions is a problem for society, while the share of taxes in the budget is a problem for the government. The level of stocks is a problem of the management that contracts products, but also of the functional departments that study the market and the competition, or that ensure the rhythmic supply of raw materials and materials necessary for the production process.

Conception of the model

In this phase, a model for adopting the decision is defined, tested and validated under the conditions of the real system. Modeling succeeds in expressing reality with the help of abstract entities that possess quantitative and qualitative attributes. Based on the defined models, possible alternatives can be generated

through an effective simulation process. The decision-maker's intuition, creativity and experience allow comparing alternatives, predicting the results of each individual alternative.

Choosing the solution

It is the phase in which the results of the previous stages materialize, in which an action is chosen according to the selection criteria and the decision-making model. There is no strict demarcation between the conception of the model and the choice of the solution, certain activities can be carried out during both phases, or they can return from the choice phase to the conception phase. After the final solution of the model, the best alternative is selected, the implementation plan is chosen. The choice of the solution is closely related to the evaluation of the results corresponding to the respective solution. The rating in turn depends on the search method. In the case of structured problems (allocation of resources, stock management), analytical methods are applied, which use mathematical formulas to obtain an optimal solution. In order to increase the efficiency of the search for the best solution, algorithms are used. In the case when the number of alternatives is too large, when all or certain possible solutions are tested, incremental search methods (blind search) are used. Time and memory space limit searches, in most situations the decision maker stops at the best solution from those tested up to a certain moment. For complex problems, the solution is carried out by progressing from one situation to another, until a final situation, which represents the solution. The methods, called heuristic methods, are based on a rigorous analysis of the problem. Practically, successive attempts are made, the search progressing from one solution to another.

Implementation of the model

This is the last phase, the one that involves integrating the chosen solution into the context and simulating the conditions in the real system. Problems raised by the communication of the solution, the acceptance of the decision or additional costs, make the implementation a difficult process, in which the decision-maker plays the important role of the mediator (Borrero-Domínguez & Escobar-Rodríguez, 2023; Zhang et al., 2023).

3. Usage of data in application for Interactive Decision Support Systems

For example this problem requires the selling price of a product is 4,750 euros. The total fixed costs are 159,000 euros. It is estimated that the value of unitary

variable expenses is 2,100 euros. It is required to provide some information for the analysis of the influence of variable unit expenses in determining the profitability threshold expressed in physical units. Solution: The problem data is entered into an Excel spreadsheet. For variable unit expenses of 2,100 and for the corresponding changes (+/-10%), scenarios are built using the Scenarios option from the Tools menu of the spreadsheet. For the comparative analysis of the results, the user can display the three scenarios on the screen (Show option).

| Scenario Summary | | | | | | |
|------------------------|------|------|------|---------------|---------------|------|
| Current Values: | S1 | S2 | S3 | s2 03.05.2020 | S1 03.05.2020 | |
| Changing Cells: | | | | | | |
| \$A\$2 | 1890 | 2310 | 1890 | 1890 | \$A\$2*1,1 | 2100 |
| Result Cells: | | | | | | |
| \$A\$2 | 1890 | 2310 | 1890 | 1890 | \$A\$2*1,1 | 2100 |

Notes: Current Values column represents values of changing cells at time Scenario Summary Report was created. Changing cells for each scenario are highlighted in gray.

Fig. 1 – Scenarios application tool

Another scenario usage is the following problem:

The total fixed costs and the selling price for a product are those in the following table. To determine the number of units sold to obtain a profit of 64080. To highlight the number of units sold to obtain a profit of 64080, in the case of variable expenses of 2100, as well as for variable unit expenses modified by +/- 10% .

Solution:

- the profit is obtained with the help of the formula:

profit = $x(c-a)-b$, where:

a = unit variable costs

b = total fixed costs

c = unit sales price

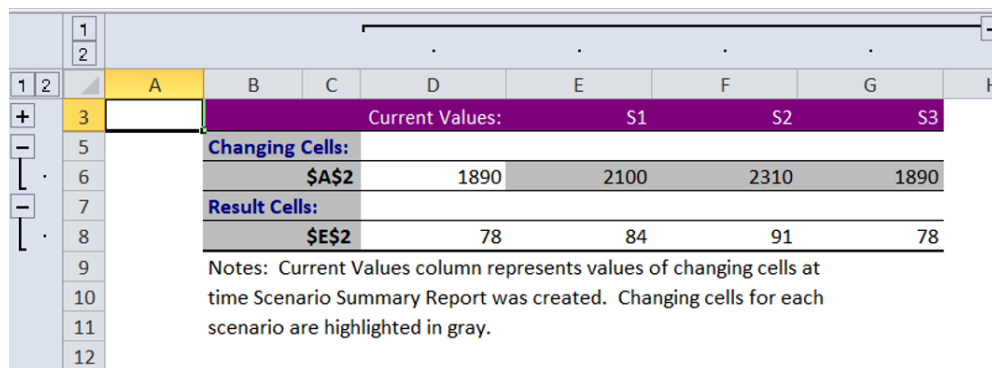
x = quantities sold in physical units

- replacing the data in the formula we get:

if a = 2100 x = 84

if a = 1890 x = 78

if a = 2310 x = 91



| | | | | | | | | |
|---|--|--|--|------|------|------|------|----|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | S1 | S2 | S3 |
| 5 | | | | | | | | |
| 6 | | | | 1890 | 2100 | 2310 | 1890 | |
| 7 | | | | | | | | |
| 8 | | | | 78 | 84 | 91 | 78 | |

Notes: Current Values column represents values of changing cells at time Scenario Summary Report was created. Changing cells for each scenario are highlighted in gray.

Fig. 2 – Scenarios application tool solver

The following problem is a goal seek scenario:

A company supplies products from countries for which the tax regime is different. The management of the company is interested in establishing an optimal structure of supplies, so that the amount of taxes paid to the budget has a certain value. Solution: In the displayed spreadsheet, G8 is the cell that contains the formula for calculating total taxes. Using the Goal Seek tool in Excel, the user can modify the structure of the supplied products by imposing a certain value on the manufacturing prices, depending on the desired value of the total taxes.

| | A | B | C | D | E | F | G |
|----|--------------|------------------|------------|-------------------|-----------------------|-------------|--------------------|
| 1 | | | | | | | |
| 2 | Produs | Pret fabrica | Transport | Taxe Vamale | Pret dupa taxe vamale | TVA | Taxe catre stat |
| 3 | P1 | 3520,2216 | 150 | 176,0110803 | 3194,210526 | 606,9 | 766,6105263 |
| 4 | P2 | 4200 | 150 | 210 | 3840 | 729,6 | 921,6 |
| 5 | P3 | 3800 | 150 | 190 | 3460 | 657,4 | 830,4 |
| 6 | P4 | 7500 | 150 | 375 | 6975 | 1325,25 | 1674 |
| 7 | P5 | 6700 | 150 | 335 | 6215 | 1180,85 | 1491,6 |
| 8 | Total | 25720,222 | 750 | 1286,01108 | 23684,21053 | 4500 | 5684,210526 |
| 9 | | | | | | | |
| 10 | | | | | | 4500 | |
| 11 | | | | | | | |

Fig. 3 – Goal seek application tool solver

Another problem is the objective function that sets a value. A company decided to supply three products, with unit prices of 3.000 euros, 2.000 euros, and 4.000 euros, respectively. The maximum quantities that can be supplied are 250, 300 and 200 respectively. What quantity must be supplied so that the total value of the supply is 1.000.000 euros? Solution: To obtain the result, use

Solver, an Excel tool that allows solving optimization problems starting from a mathematical model Let P1, P2 and P3 respectively be the quantities for each of the three products. The mathematical model is:

1) objective function: [value of] $10000 f = 30 * P1 + 20 * P2 + 40 * P3$

2) the restrictions $P1 < 250; P2 < 300; P3 < 200$

Initial entry in the spreadsheet:

| | A1 | fx | | | | | | |
|---|----------------|----------|------|--------------|---|---|---------------|---|
| | A | B | C | D | E | F | G | H |
| 1 | | | | | | | | |
| 2 | product | p1 | p2 | p3 | | | | |
| 3 | price | 3000 | 2000 | 4000 | | | | |
| 4 | Available | 250 | 300 | 200 | | | | |
| 5 | | | | | | | | |
| 6 | Editable cells | | | F. objective | | | F. calculated | |
| 7 | p1 | 103,076 | | 1000001 | | | 1000001 | |
| 8 | p2 | 69,02274 | | | | | | |
| 9 | p3 | 138,1819 | | | | | | |

Fig. 4 – Objective function that sets value application tool solver

Another problem is the objective function that maximizes his value. A company decided to make an investment worth 1.000.000 euros in its two sections. In section S1 the investment must not exceed 600.000 euros, and in section S2 it must not exceed 700.000 lei. The benefit obtained for the S1 section is 20% and in the S2 section 30%. What amount should be invested in each section so that the benefit is maximum? Solution: The mathematical model:

1) Objective function: [max] $f = 0.2 * S1 + 0.3 * S2$

2) Restrictions: $S1 + S2 < 1000000$ $S1 <= 600000$ $S2 <= 700000$ $S1 > 0$ $S2 > 0$ The result obtained with the Solver tool in Excel is the one presented in the following figure:

| | G7 | | fx =B3*B7+C3*B8+D3*B9 | | | | | | |
|---|----------------|---------|-----------------------|-------------|---|---|-------------|---|--|
| | A | B | C | D | E | F | G | H | |
| 1 | | | | | | | | | |
| 2 | Shops | s1 | s2 | | | | | | |
| 3 | Available | 600000 | 700000 | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | Editable cells | | | F. obiectiv | | | F. calculat | | |
| 7 | s1 | 300000 | | 270000 | | | 6,7E+11 | | |
| 8 | s2 | 700000 | | | | | | | |
| 9 | s1+s2 | 1000000 | | | | | | | |

Fig. 5 – Objective function that maximizes his value application tool solver

Decision support systems represent a natural evolution from information reporting systems to transaction processing systems. These systems are interactive, representing IT-based information systems that use decision-making models and specialized databases to assist managers in decision-making processes.

4. Conclusions

Decision support systems are different from transaction processing systems, which focus on processing data generated by transactions and business. Also, they differ from information reporting systems that focus on providing pre-specified reports for managers, reports that help them make complex decisions. Instead, decision support systems provide information to managers in an interactive session or in an ad hoc manner (depending on the need). Such a system provides analytical modeling, data retrieval, and information presentation capabilities that enable managers to generate the information needed to make decisions in an interactive computerized process (Borrero-Domínguez & Escobar-Rodríguez, 2023; Kim et al., 2023). When using a decision support system, managers research possible alternatives and receive experimental information based on a set of alternative assumptions. Thus, the decision-makers do not have to specify the information requirements a priori, the system interactively assisting them to find the information they need. Decision support systems are computer systems that help managers make important decisions considering different scenarios and data sources, but at the same time they can set goals and objectives, as well as the possibility to maximize or minimize certain indicators.

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WHY ECONOMIC OPTIMISM COLLAPSES? THE BUSINESS ENVIRONMENT – THE ONLY COMPETENT AND ETHICAL GLOBAL INSTITUTION

Radu GHEORGHE, Lecturer PhD

Athenaeum University, Bucharest, Romania

radu.gheorghe@univath.ro

Abstract: *The data from the Edelman Confidence Barometer 2023 (23rd edition) is not encouraging at all. The collapse of economic optimism is accompanied by a widening of social gaps against the background of the continuous decline of the population's trust in politicians, the media, and the church. The only global institution currently perceived as both competent and ethical is business. Corporations seem to be at the top of trust, seeming to be, at least for Romania, an underestimated actor so far. The increasingly favorable perception regarding ethics in the business environment makes us advance our hypothesis that there is already a huge pressure on the corporate executive, with expectations even targeting their involvement in solving society's problems.*

Keywords: *business environment, climate change, discrimination, economic optimism, immigration, multi-polar world, quartile of income, wealth gap*

JEL Classification: *A14, Z10*

1. How to face economic fears without a trust safety net?

The latest Edelman Confidence Barometer cancels, at the beginning of 2023, the views that placed favorably the perception of the recovery of the world economy after the crisis generated by Covid-19, but also after the outbreak of the war in Ukraine.

According to the data, we are recording a real collapse of global economic optimism:

- If in the period 2019-2022 there was a decrease in economic optimism of only 3% (from 53% to 50%), in the last year (2022-2023) the decrease was 10%;

- The Edelman experts report shows that economic optimism has collapsed worldwide from 50% to 40%;
- 13 of the 28 analyzed countries recorded a decrease of at least two digits in the last year (Colombia had the most drastic decrease – 22%);
- No developed country exceeded 36% in terms of economic optimism, 24 of the 28 countries analyzed reached an all-time low in 2023, including states such as the USA (36%), Germany (15%), Great Britain (23%) or Japan (9%);
- Otherwise, in terms of economic optimism the maximum level of trust among the 15 developed countries is reached by the USA (36%).

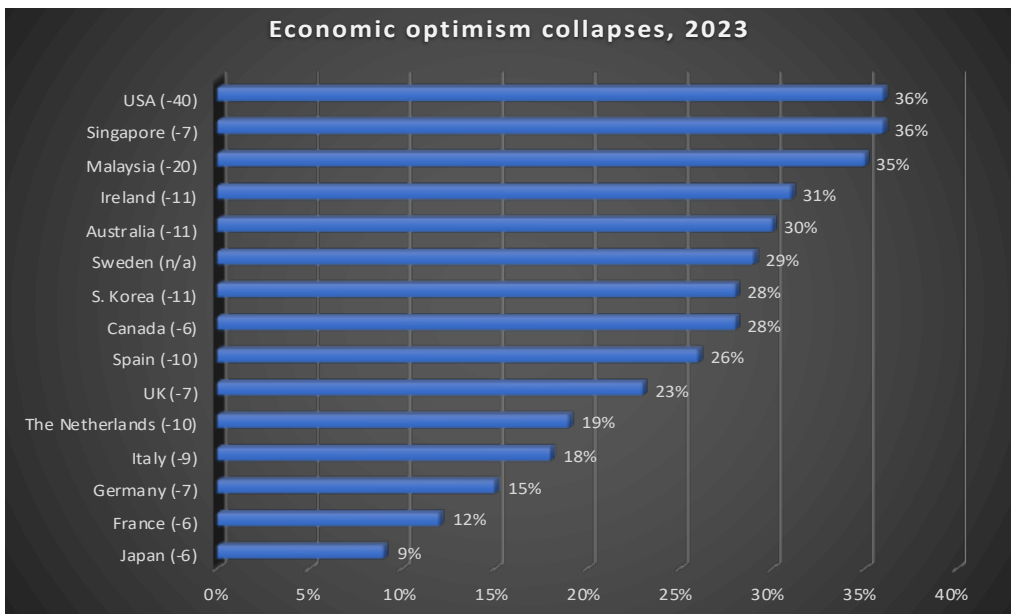


Figure 1: My family and I will be better off in five years

Source: Author

It should also be noted that changes in perception are accompanied by a deepening of perception gaps between social classes. „Income-based inequality creates two trust realities. People in the top quartile of income live in a different trust reality than those in the bottom quartile, with 20+ point gaps in Thailand, the United States, and Saudi Arabia” (Edelman Trust Barometer, 2023, p. 4). Thus, in around 75% of the countries analysed, there is a double-digit difference in institutional trust, with people with higher incomes trusting institutions more than those with lower incomes:

- Since 2012, there has been an average increase in the trust of people with high incomes from 50% to 62%, while for people with low incomes the average trust has only increased from 43% to 48%;
- Practically, income based inequality creates two different trust realities;
- Globally, there is a 15% difference between the two cohorts in terms of institutional trust;
- In 21 of the 28 countries the difference in perception is double digits, the biggest being in Thailand (37%).

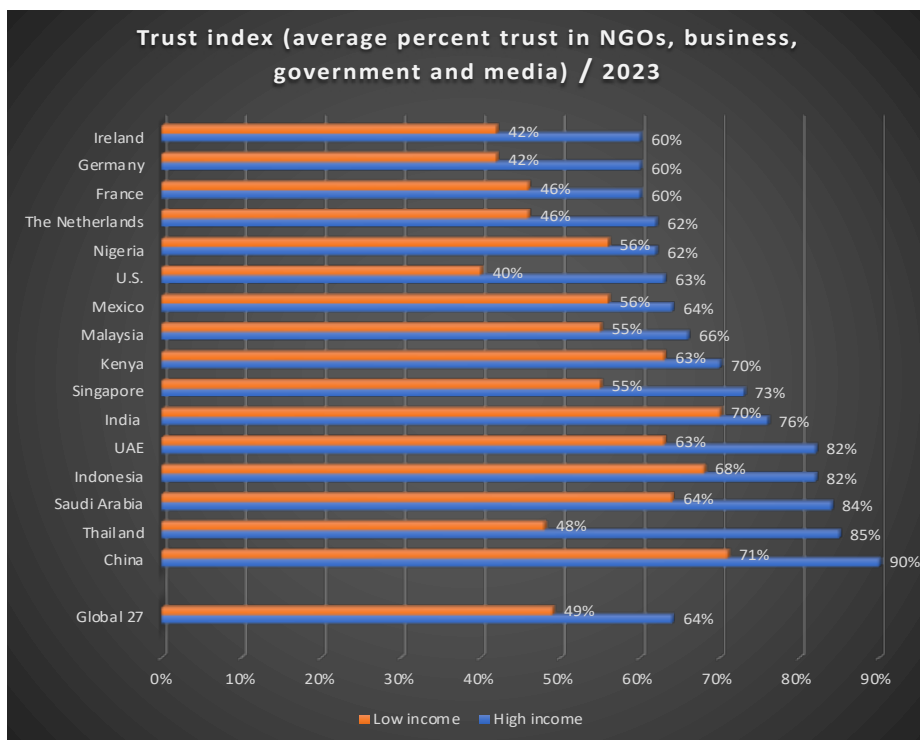


Figure 2: Income-based inequality creates two trust realities

Source: Author

As can also be seen in Figure 3, greatest income-based trust inequality was found in Thailand (37%), U.S. (23%), Saudi Arabia (20%), China (19%), Japan (19%), UAE (19%).

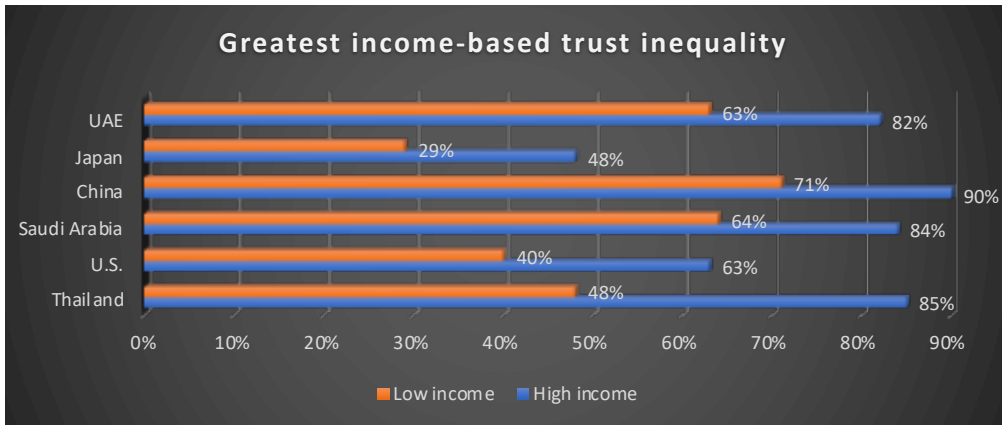


Figure 3: Greatest income-based trust inequality / 2023

Source: Author

According to the Edelman Trust Barometer, government and media fuel cycle of distrust, seen as sources of misleading information.

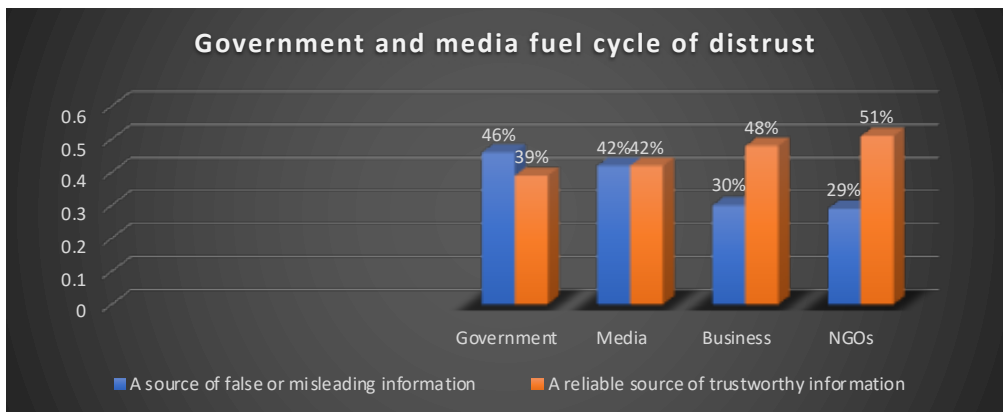


Figure 4: Government and media fuel cycle of distrust / 2023

Source: Author

Otherwise, as seen in Figure 5:

- On the hand, government leaders (41%) and media leaders (47%) are the least trusted institutional leaders;
- On the other hand, scientists (76%), work colleagues (73%) and CEOs (64%) are the most trusted.

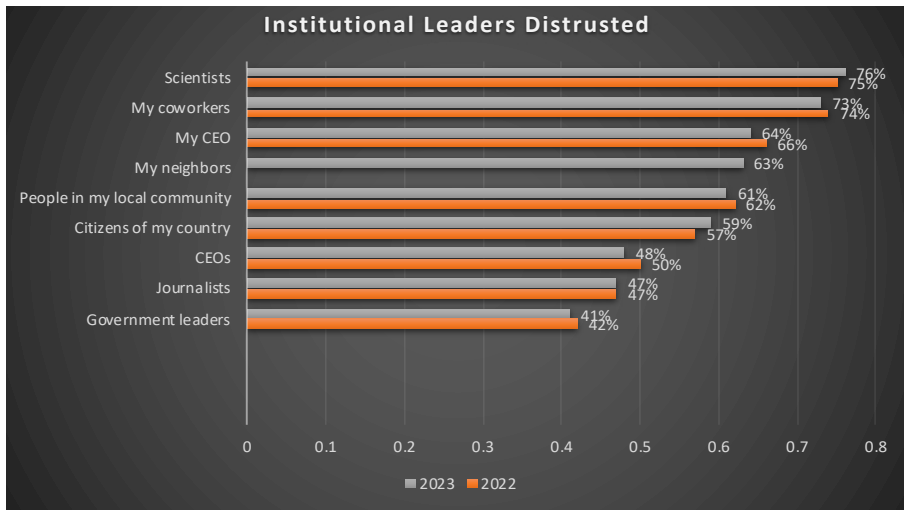


Figure 5: Institutional leaders distrusted / 2023

Source: Author

The countries with the lowest institutional trust, for each individual institution, are the following:

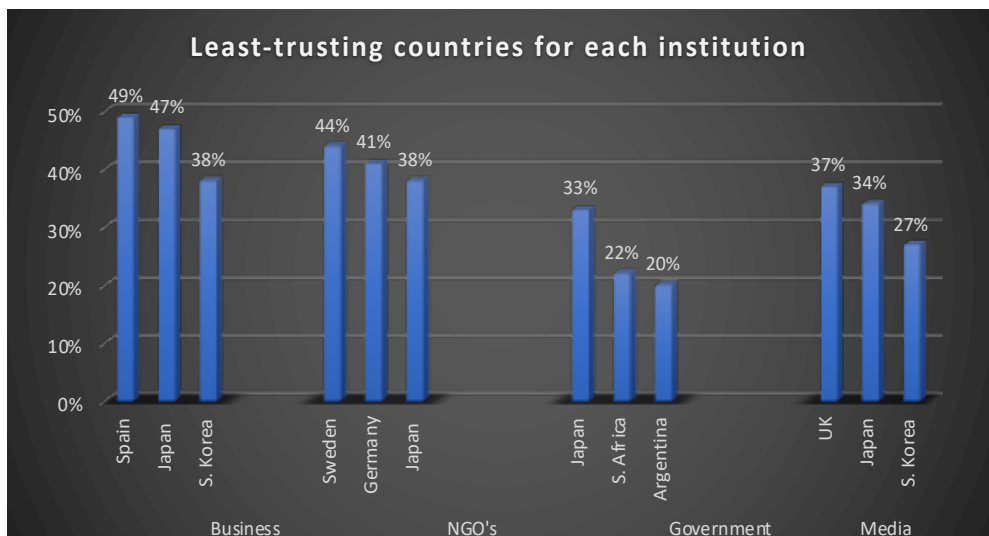


Figure 6: Least-trusting countries for each institution (Business, NGO's, Government, Media) / 2023

Source: Author

We notice a double-digit trust advantage for business in 15 of 28 countries:

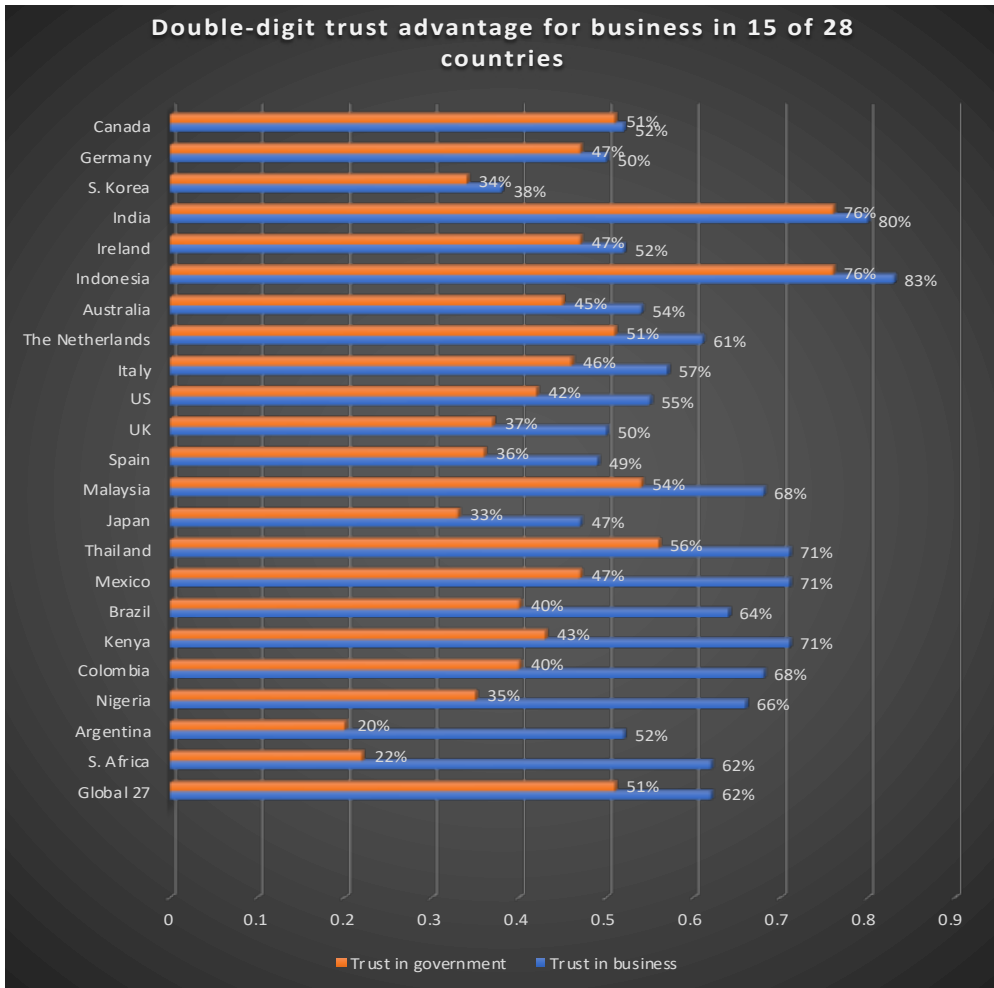


Figure 7: Double-digit trust advantage for business in 15 of 28 countries

Source: Author

It is also worth noting that the collapse of economic optimism accompanied by the huge setback in institutional trust has meant that among the population personal anxieties remain very high and are perceived almost as much as existential fears. We notice a very interesting situation - personal anxieties on par with existential fears.

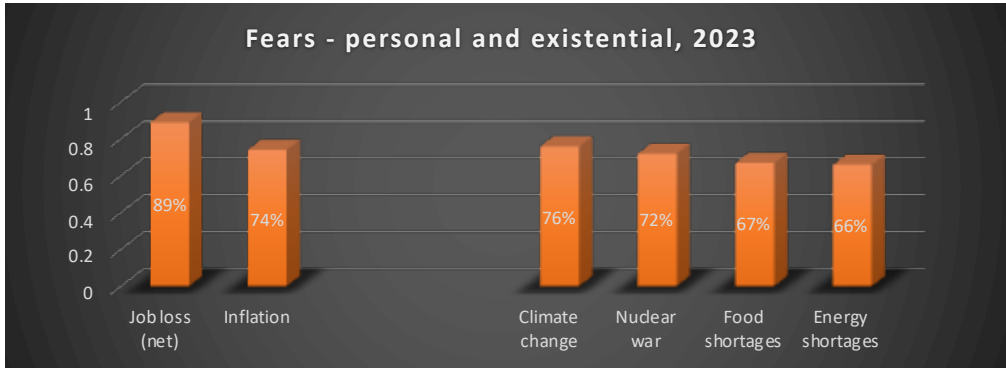


Figure 8: Personal anxieties on par with existential fears

Source: Author

2. The business environment, the only competent and ethical global institution

Data provided by the Edelman Trust Barometer 2023, suggests that amid collapsing economic optimism, business is seen as the only trusted institution globally, seen as the only institution both competent and ethical:

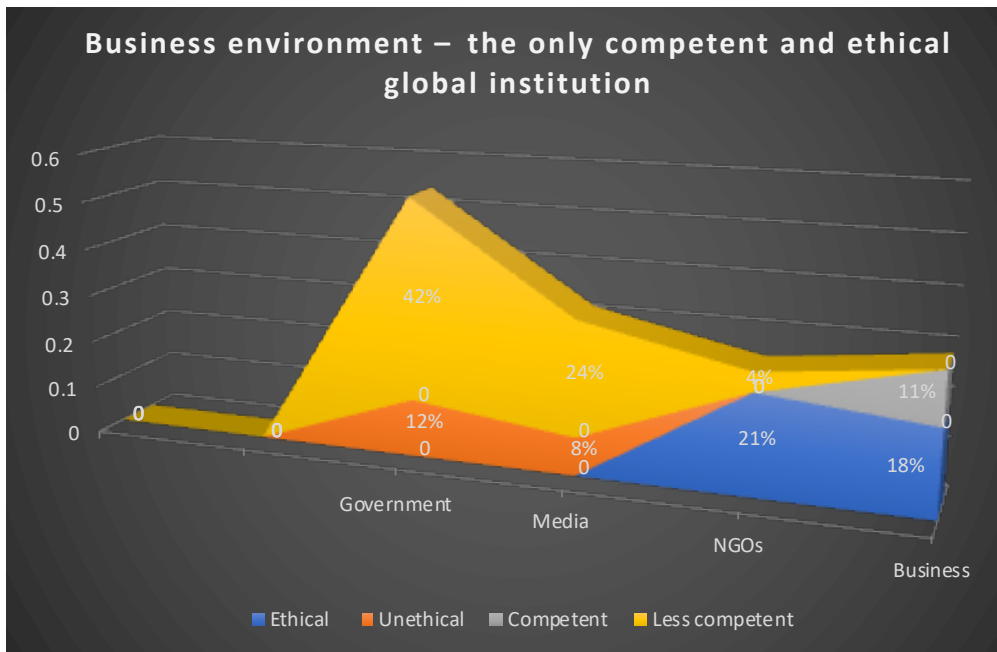


Figure 9: Business environment, the only competent and ethical global institution

Source: Author

- The business environment has a 53% lead over the government in terms of competence and 30% in terms of ethics (government is seen by the population as both incompetent – 42% and unethical – 12%);
 - The jump of the business environment in terms of ethics is 20% in the last three years and is explained, according to experts, by the attitude it had had during the pandemic, but also by the appropriate reaction of the more than 1000 companies that have left Russia immediately after the invasion of Ukraine;
- Even if we observe a 3% advance of NGOs compared to the business environment in terms of ethics, they remained far behind the business environment in terms of competence (-15%), being considered incompetent by the population;
- In comparative terms, the mass media is also far behind the business environment both in terms of competence (-35%) and ethics (-26%), being seen by the population as both incompetent and unethical.

Increased perception of the business environment has brought higher expectations from CEOs who are being asked to become a much more engaged voice in societal issues - by an average of 6 to 1 the population wants them to be more involved in problems that affect a large portion of society and require collective action to address (climate change, economic inequality or retraining of the workforce).

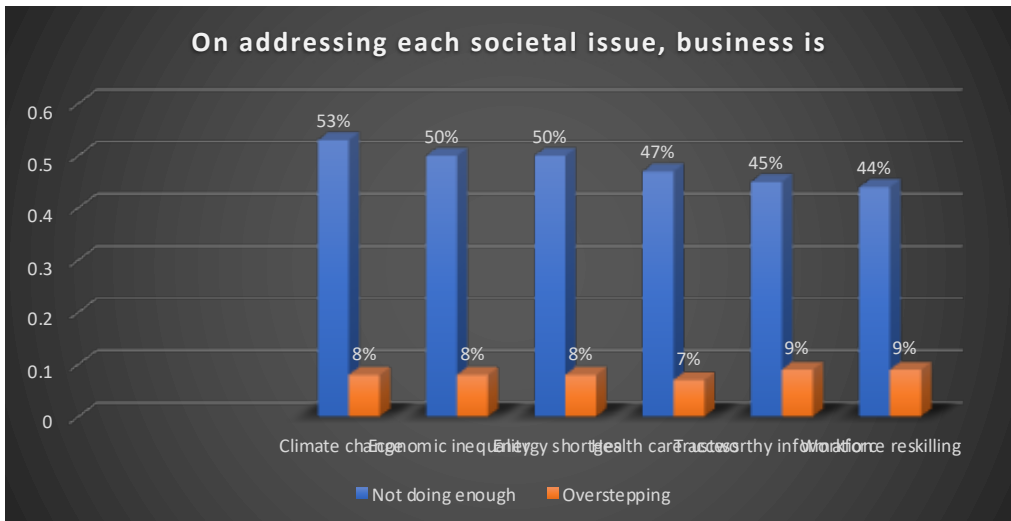


Figure 10: Want More Societal Engagement from Business, Not Less / 2023

Source: Author

The Edelman Trust Barometer 2023 data also reveals the population’s fear that societal engagement puts business at risk of being politicized something that should be avoided. To the question “I think business can avoid being political when it addresses contentious societal issues?” less than most agree in 19 of the 28 states surveyed.

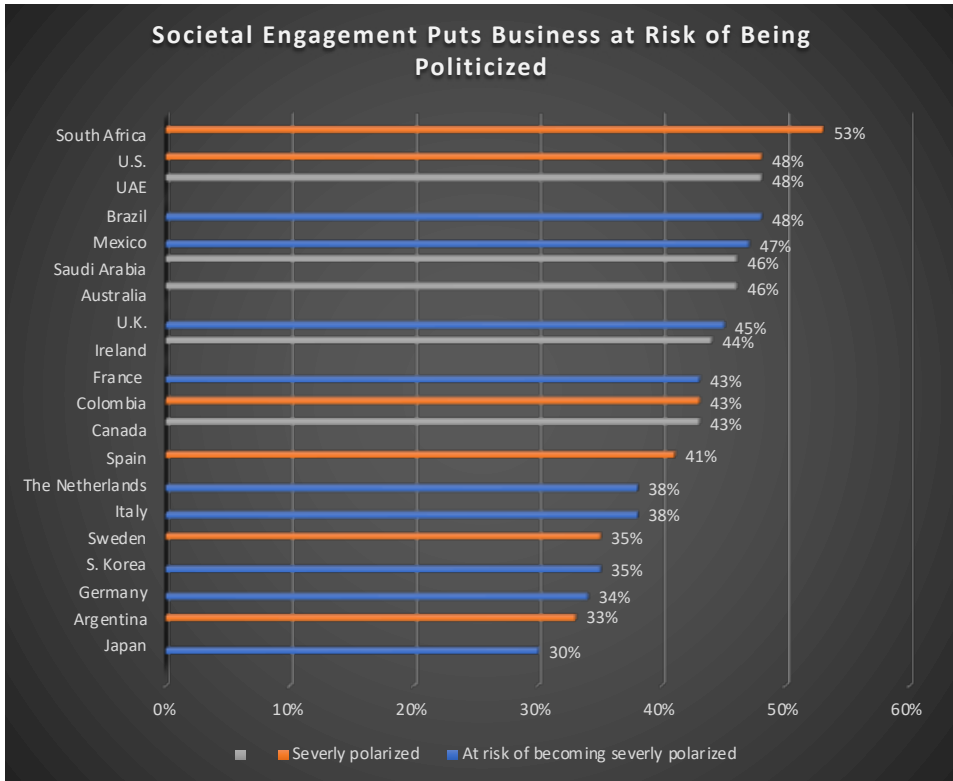


Figure 11: Societal Engagement Puts Business at Risk of Being Politicized, 2023

Source: Author

At the European level, among the states that were the subject of the research, the states with a major risk of becoming severely polarized on this topic are Germany (34%), Italy (38%), the Netherlands (38%), France (43%) and the Britain (45%), and which are already severely polarized are Sweden (35%) and Spain (41%).

It should also be said that more than half (52%) of respondents do not believe that business can avoid politicization when dealing with contentious societal issues.

The other 48% of respondents do not declare themselves so categorically on that issue, appreciating that in order to avoid being seen as politically

motivated when you take a stand to solve the contentious problems of society you should:

- Be a trustworthy information source,
- Base actions on science,
- Don't align with only one political party,
- Act on same values over time,
- Link actions to staying competitive.

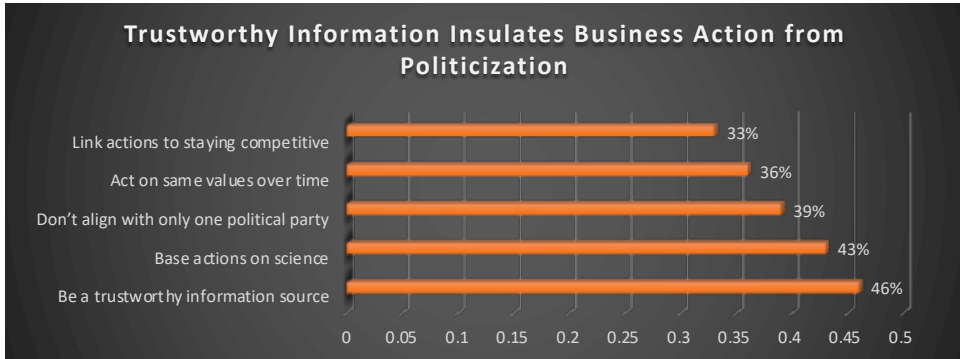


Figure 12: Trustworthy Information Insulates Business Action from Politicization, 2023

Source: Author

In the current context, a very large proportion of respondents believe that the best results for society are recorded when there is a harmonious collaboration between the business environment and the government to solve contentious issues.

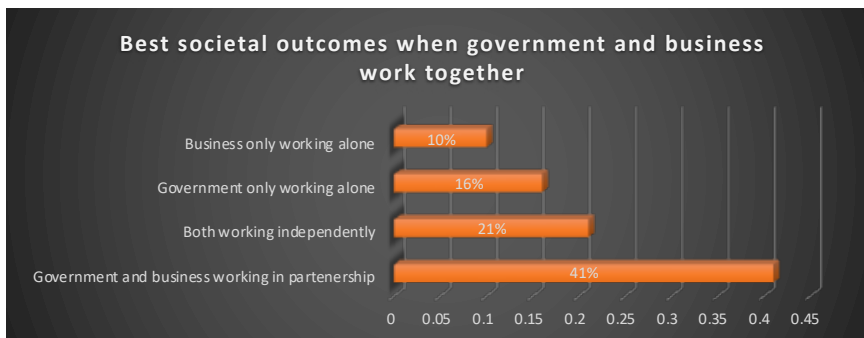


Figure 13: Best societal outcomes when government and business work together, 2023

Source: Author

Practically there are 4 x more likely to yield optimal results from partnership than business alone. In this context of a severe decline in economic optimism and the shift of the trust pole to the business environment, there are very high expectations from the executive directors who should take public positions on issues aimed at:

- Treatment of employees,
- Climate change,
- Discrimination,
- Wealth gap,
- Immigration.

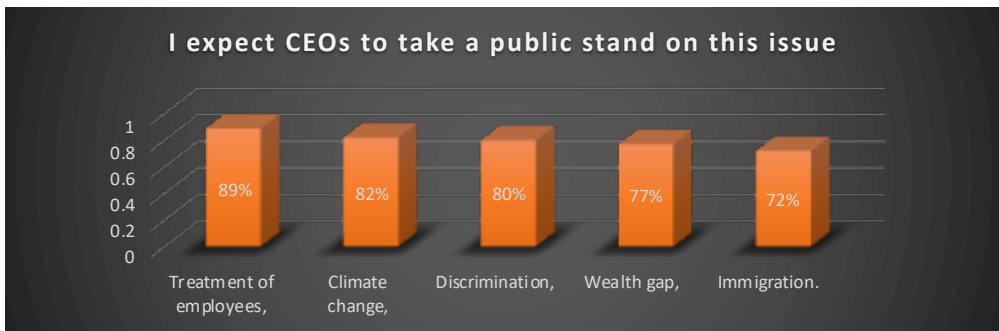


Figure 14: CEOs Most Expected To Act on Employees, Climate, and Discrimination, 2023

Source: Author

The data show that to improve economic optimism, CEOs should invest by fair compensation in community, including skills training.

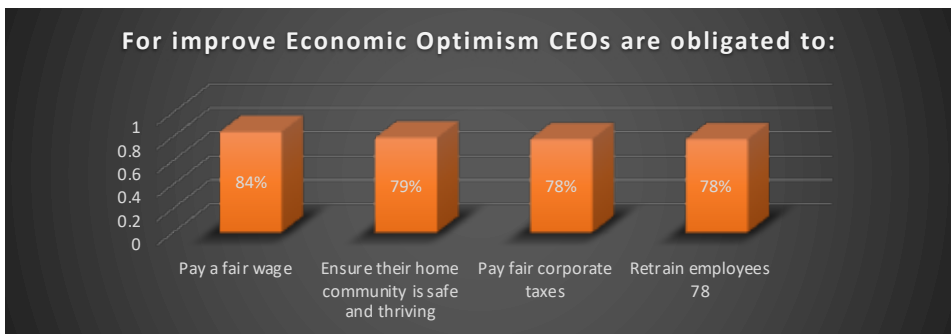


Figure 15: Improve Economic Optimism, 2023

Source: Author

Conclusions

- The positive perception of the business environment brings, as expected, higher expectations from CEOs who are expected to become an important voice regarding societal issues
- It is appreciated that in an excessively polarized world, the business environment has:
 - **To continue to lead** responding to increasing expectations and responsibilities, being the most reliable institution;
 - **To collaborate with government** the best results being recorded when the two institutions work together and not independently of each other;
 - **To restore economic optimism** by engaging further in the community, investing within the paradigm that opposes the divisive forces that fuel economic grievances;
 - **To play the role of advocate of the truth** - source of reliable information, authority that correct and hold accountable the sources of false information.

In Romania, the role of corporations is currently underestimated. Against the backdrop of the loss of trust in politicians, the media or the church, certainly the role of corporations in Romanian society has definitely increased in recent years

In the introductory part of his book “*Sociability in the space of development. Trust, tolerance and social networks*” professor Dumitru Sandu problematizes the dynamics generated inside the “social-development” equation by asking an essential question: “How to bring the social into the field of development? Or, to put it even more simply, how to make investments, programs and development policies useful as much as possible for as many people as possible?” (Sandu, 2003, p. 9).

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WORK–FAMILY BALANCE DURING COVID-19 PANDEMIC IN EU MEMBER STATES

Dalina-Maria ANDREI, PhD

Institute for Economic Forecasting, Bucharest, Romania
dalinaandrei@yahoo.com

Abstract: *This paper analyzes how much the people's family life and work were both affected and how these two affected each other during the COVID-19 Pandemic within the European Union countries. It includes: concepts and a historical view of family-work relationships and finally a statistical analysis based on the survey named "Living, working and COVID-19", done by the European Foundation for the Improvement of Living and Working Conditions (Eurofound) during 2020 and 2021. For this analysis, we have selected specific indicators assumed to indicate how the pandemic affected the individual's family life in EU countries and how this last, in turn, affected the same people's ordinary earning life work. As in detail, aspects like keeping/changing/loosing job, raising/lowering the working time will be connected to those of specific psychological impact worrying about work/ anxiety/ lack of concentration. The obtained results demonstrate that conflicts have arisen in the family work relationship generated by (i) concerns about job security and income (6.3% of EU respondents in 2020), (ii) losing jobs permanently or temporally (28.2% of the EU employed person), (iii) significant reduction in working hours (32.4% of employees), (iv) financial worsened situation (38% of the employed population of EU), (v) started to work at home/remotely as a result of the pandemic (36.3% of interviewed employees). Conclusions of the study indicate that during the pandemic, work-family balance was significantly deteriorated, which was caused by bidirectional conflicts between work and family domains.*

Keywords: *work - family balance, work-family conflict, COVID-19 Pandemic, European Union*

JEL Classification: *J01, J28, J81, J83*

1. Introduction

The COVID-19 pandemic has generated significant disruptions in various aspects of life including the balance between work and family responsibilities. As the world was fighting with the health and socio-economic consequences of the health crisis, individuals saw themselves included in new work arrangements, increased caregiving responsibilities, and higher uncertainties. These circumstances have highlighted the importance of work-family balance and its impact on individuals' well-being and productivity. Here we will start by exploring definitions and historical context of work-family balance, providing a foundation for understanding the complexities of this multifaceted issue. A literature review about these concepts will be also briefly presented. Furthermore, statistical data from the large scale Eurofound (European Foundation for the Improvement of Living and Working Conditions) survey "Living, Working and COVID-19" was helping us in obtaining valuable insights into the experiences and challenges faced by individuals across European Union (EU) member states. Europe was one of the hardest hit regions by COVID-19 so, we expect that Eurofound dataset to capture diverse realities of work and family dynamics during this extraordinary period. By examining key issues such as: job security perception, job permanently / temporary loss, changes in working hours, psychological impact on the work-family balance, concerns regarding work and family and trust in authorities, this article seeks to shed light on the impact of the COVID-19 crisis on work-family balance in EU countries in order to found if the work-family balance was deteriorated and to understand the challenges faced by individuals and families during times of crisis.

2. Literature review

The concept of *work-family balance* means the integration and harmonization of work and family life (Frone, 2003). The commonly accepted definition of work-family balance is the absence of conflict between work and family roles. As described by Greenhaus & Beutell (1985), work-family conflict refers to "*a form of inter role conflict in which the role pressures from the work and family domains are mutually incompatible in some respect*". Put simply, work duties can create challenges that affect family life (work-family conflict), while family responsibilities can have an impact on work (family-work conflict). Furthermore, Frone (2003) proposes that work-family balance should be understood as a multidimensional concept, considering both the reciprocal

influence between work and family roles (work-to-family and family-to-work) and the nature of that influence (conflict or facilitation).

Greenhaus, Collins & Shaw (2003) in their turn defined the *work-family balance* as an individual capability in managing and find satisfaction in both the employee role and the family role. They divided the concept of work-family balance in three components: *time balance*, *involvement balance*, and *satisfaction balance*. Time balance considers an equal allocation of time between work and family; involvement balance considers an equal engagement in work and family roles; and satisfaction balance relates to equal satisfaction derived from both work and family. Their study about relation between work-family balance and quality of life, found that individuals who combined work and family roles, experienced a higher quality of life when they spent more time on family than work.

According to Kahya and Kesen (2014), both work and family hold significance in individuals' lives. While they can bring happiness, they can also lead to *conflicts in both work and family domains*. It is considered theoretically that employees' personal lives should not impact their work life. However, in reality, people undergo various events that can have positive or negative effects on other aspects of their lives. Kossek and Lee (2017) highlighted that work-family conflict represents a form of work-life conflict. They emphasized the increasing significance of work-family conflict in society, as it have substantial implications for work-related outcomes, non-work aspects, and personal well-being (such as productivity, turnover, family well-being, health, and stress). Their research indicated that work-family conflict directly and indirectly affects majority of the global population and is not limited to individuals with family responsibilities, as even single individuals and those without children reported experiencing some level of work-family conflict.

The simultaneous demands of work and family inevitably lead to work-family conflict, as noted Wang and Shi (2022). Authors find in their review of work-family conflict that this conflict can manifest in *three forms*: time-based conflict, which happen when individuals have difficulties to meet the demands of both work and family simultaneously due to limited time; stress-based conflict, which arises from the psychological stress or negative emotions when individuals are engaged in work or family roles; behavior-based conflict, which arises from the mismatch between the behaviors exhibited in work and family roles. These three types of conflict highlight the challenges individuals face when balancing work and family responsibilities, and they can significantly impact both areas of life. According to Wang and Shi (2022) the presence of work-family conflict is associated with lower job satisfaction and a higher degree of psychological burnout, mental health problems, and a decline in family quality of life.

3. Methodology

Data were collected by Eurofound in their survey entitled “Living, Working and COVID-19” in 2020 and 2021 through online questionnaires or telephone interviews, ensuring a wide reach and representative sample. The survey respondents were selected in order to ensure demographic diversity and representation across EU member states. The findings derived from the data analysis will be interpreted and discussed in the context of the research objectives and the existing literature on work-family balance/ or conflict during the COVID-19 crisis. Some limitations of using the Eurofound survey data to extract conclusions may include respondent’s bias and inability to establish causal relationships between family – work issues.

Research question: Job loss (temporary or permanent), reduced working hours and start to work remotely during the COVID-19 Pandemic, followed by financial constraint, have had a significant impact on the work-family relationship in EU countries?

4. Results and discussions

Data collected from each round of the Eurofound survey provide insights into different aspects such as employment status, working hours, work-life balance, jobs security, jobs quality, teleworking levels, and experiences of working from home.

4.1. Jobs security perception during COVID-19 crisis

At the EU aggregate level, the percent of respondents who thought they might lose their job in proximate three months remained low during all survey rounds and slightly decreased (6.3% in 2020 to 3,6% in 2021). A higher percentage belongs to respondents very likely to not losing jobs (43-52% of respondents) in the immediately following periods of survey rounds. The rest of employed respondents who were not included in those two categories (very likely or very unlikely) were uncertain in losing or not losing jobs in next near months. The countries where respondents were most likely sure in losing their job according to their perception were Bulgaria (19.9% from persons interviewed), Greece (15.4%) and Romania (10.3%). These percentages were specific to the lockdown period of April/May 2020 in Pandemic COVID-19 period. In the following survey rounds, a second one when almost all restrictions were ended (June/July 2020) and the third one (February/March 2021), the job security

perception changed but its significance remains rather the same in the EU countries, e.g., in Bulgaria (8%), in Greece (8.9%). In Romania perception of job losing were decreased to 4.6 % in June/July 2020 and to 2.6% of the respondents in the first months of 2021.

Atypical behavior was recorded in (i) Sweden, just in the second survey round of June - July 2020 (when 7.9% from respondents were very likely sure to lose their jobs in the following months, even when the restrictions had ended and the economy was gradually reopening and in (ii) Slovakia, where people thought they'd lose their jobs in 2021, more or almost in equal proportion with 2020. Some reason for differences in job loss perception across the EU countries could be the economic stability of some EU countries with lower unemployment rates. Also, the structure of a country's economy and the composition of its industries play some role. Some industries also may be more resilient during times of crisis, while others, such as tourism or hospitality, may be more vulnerable. Countries with a larger share of industries severely affected by the pandemic may have a higher perception of job loss. Government support and policies could also influence the perception of job loss. Countries with well-developed social protection systems, strong unemployment benefits, and active labor market policies may provide more reassurance and reduce job loss perception. Also, the quality and clarity of communication from government authorities and employers regarding job security can impact perceptions.

Last but not least, the trust in institutions such as the government, employers, and labor unions, can influence job loss perception. A higher trust may lead to greater confidence in the ability of institutions to protect jobs and mitigate the impact of crises.

On the opposite side, employed people who considered *very unlikely* to lose their jobs were recorded in Luxembourg (67.9%), Netherlands (61.8%) and Denmark (60.3%) in the lockdown interval of April/May 2020 and this high level of perception was maintained in these countries during the rest of 2020 and first part of 2021. However, the employed people perception in not losing jobs increased in majority of EU countries, together with lifted pandemic restrictions. Significant increase of trust in not losing jobs was recorded in Bulgaria (from 17.2% in April/May 2020 to 42,7% in Feb/March 2021); in Poland (from 16.8% to 37.3% and in Slovenia from 21.6% to 53.7% in same intervals). The increase in trust in not losing jobs in these countries indicates that employees in these regions likely experienced a level of stability and security in their remote work arrangements. As remote work became more prevalent, companies and organizations adapted to the new reality and found ways to continue their operations while ensuring their employees' safety.

Then, about effective losing jobs during COVID-19, Eurofound survey found approx. 28.2% of the EU employed person who lost their jobs, 5.3 % permanently and 22.9% temporarily. As we compare this 5.3 % of permanently jobs lost (for EU as a whole) with previous data, results are similar to what was really expected from some people employed which were very likely to lose their jobs (6.3%). Further on, 22.9% declared losing jobs just temporary and 70.2% did not lost their jobs (fig.1).

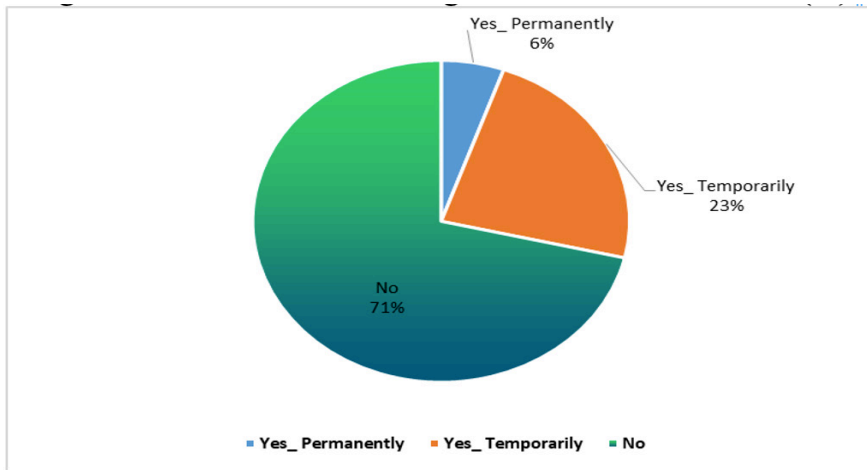


Figure 1. EU27 - Jobs lost during the COVID-19 Pandemic (%)
Source: Eurofound (2020)

If look at results for individual countries, *the highest number* of permanently jobs lost during Covid-19, approx. 10.4%, were declared by Bulgarian respondents followed by Hungary (8.2%) and Poland (8.1%). In some of these countries the reality was similar with the previous corresponding perception of job losses - e.g., the highest in Bulgaria.

The lowest percents of job contracts permanently lost during pandemic were recorded in Denmark (1,2%), Sweeden (2.2%), Belgium (2,8%), Ireland (2.9%), Luxembourg (3%). In some of those countries, perception of employed people who considered very unlikely to lose their jobs was also very high - e.g., Luxembourg, Denmark. As for temporary jobs lost Greece had the highest percent of respondents 40.1% who declared their jobs temporary lost during Covid 19 crisis, followed by those from Cyprus with 36.2%, from Slovenia with 34.5% and from Romania with 31.8%.

The number of job losses varied across countries within the EU, being influenced by factors such as the severity of the pandemic, government

responses, and economic conditions. Each country's unique circumstances played a role in determining the magnitude of job losses experienced. We should also mention that the majority (70.2%) of Europeans did not lose their jobs during COVID-19. This EU average was overpassed by Sweden (89.3%), Denmark (88.6%), Luxembourg (85.1%), Netherlands (84.1%).

4.2. Changes in working hours during COVID-19 pandemic

The lockdown period (April/May 2020) brought significant changes in the number of working hours for employees across the EU. The number of hours worked decreased for EU as a whole, with 32.4% of employees reporting a significant reduction of hours worked, and a similar proportion (31.5%) reported the same number of hours worked as before pandemic. However, the number of working hours impacted by COVID-19 restrictions varied from country to country.

As for individual countries significant reductions in the number of hours worked between April and May 2020 (Eurofound) were reported in Croatia, Cyprus, France, Greece, Italy, Malta, Spain, and Romania. These countries working hours were above the EU average level (32.4% of respondents).

On the opposite side, Sweden recorded a lower percentage, with only 6.2% of employed persons reporting a decline in hours worked (fig.2). However, in the majority of countries, employees responded that the number of hours worked remained unchanged from before the pandemic. The graph below represents the EU countries based on the number of significant reductions in hours worked during April/May 2020.

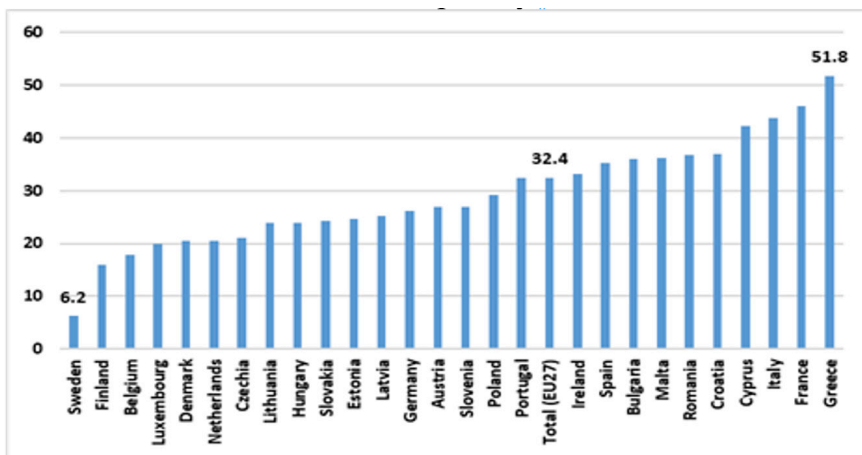


Figure 2. EU27 - significant decrease in working hours (% of respondents) - 2020 Apr/May. Source: Eurofound (2020)

The COVID-19 Pandemic hit important sectors such as tourism, hospitality, and retail (UNWTO and IMF,2020). The closure of businesses, travel restrictions, and reduced consumer spending had led to a decrease in economic activity and, consequently, to a reduction in working hours (economic impact). For instance, countries heavily reliant on seasonal tourism, and not only, experienced significant disruptions due to travel restrictions and reduced demand. Italy and Spain have been among the countries hit earliest and hardest by the coronavirus pandemic (WEF,2020) followed by France and Greece (UNRIC,2020).

4.3. Financial situation worsened during COVID-19 Pandemic in EU

Reduction in hours worked or job loss (temporarily or permanent) were often associated with a reduction in pay and benefits (Anderson & Kelliher, 2020). Regarding the financial situation of households during the period of 2020-2021, Eurofound data revealed that 38% of the employed population in Europe experienced a worsening financial situation in April/May 2020 in lockdown interval. However, there was an improvement in the financial situation at the EU level, with just 26.3% of respondents in February-March 2021 reporting a deterioration in their financial situation compared to the previous three months (fig.3).

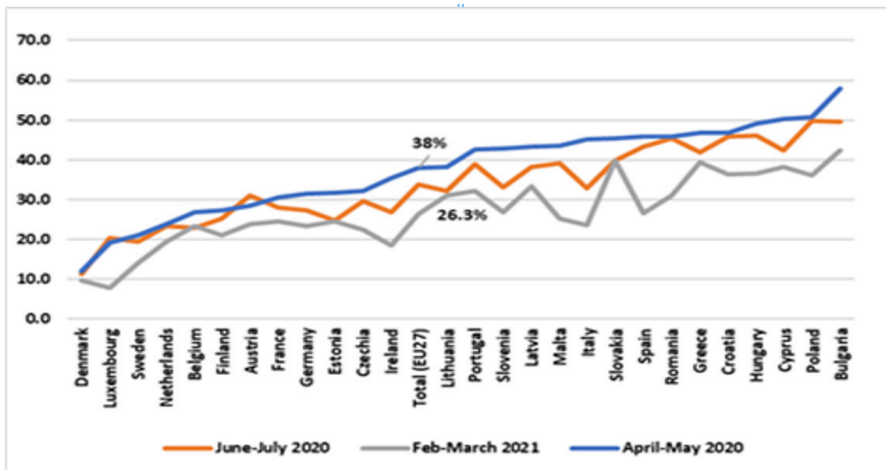


Figure 3. EU27-Financial situation of household compared to previous 3 months by country, (% of respondents)

Source: author's calculation based on Eurofound (2020)

There can be distinguished two groups of EU countries, with differing levels of financial worsened situations during Pandemic. The first group includes countries such as Italy, Slovakia, Spain, Romania, Greece, Croatia, Hungary, Cyprus, Poland, and Bulgaria, with Bulgaria having the highest percentage of respondents who experienced a worsened financial situation. These countries also had higher percentages of respondents reporting highest financial difficulties.

In the second group of EU countries (Denmark, Luxembourg, Sweden, Netherlands, Belgium, Finland, Austria, France, and Germany), the financial situation also got worse, but for a smaller number of people, ranging from 12% to 30%. Various factors could have generated these differences in financial situations among EU countries such as the severity of the pandemic's impact on specific industries, government support measures, and the overall resilience of national economies. One aspect of economic resilience that has been crucial throughout the pandemic is the extent to which activity shifted rapidly from on-site to remote work (OECD,2020).

4.4. Working at home as a result of COVID-19 Pandemic

During the Covid-19 pandemic, many employees have been forced to work remotely, making it even more valuable to understand their experience Zhang, Yu & Marin (2021). Individuals who had not previously considered or been provided with the option to work remotely found themselves compelled to do so (Anderson & Kelliher, 2020). Regarding the EU, 36.3% of interviewed employees declared that they started working from home due to pandemic restrictions. The proportion of those who began their remote work solely as a result of the pandemic varied, with the lowest weight reported in Romania at 19% (likely due to less prior experience in the remote working), and the highest weight recorded in Finland at 61%. Countries that exceeded the EU average in this (36.3% of respondents in the first round of the Eurofound survey) were Luxembourg, Belgium, the Netherlands, and Denmark, with over 50% of interviewed employees transitioning to remote work solely due to the pandemic. They were followed in this same order by Ireland, Austria, Italy, and Sweden, with approximately 40% (fig.4)

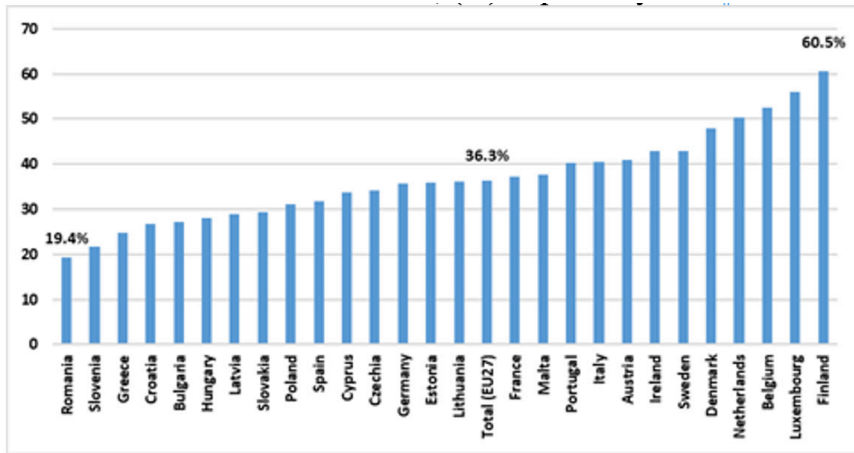


Figure 4. EU27 employed people who started work from home as a result of the Covid-19 situation, (%) - April/May 2020. Source: Eurofound (2020)

4.5. Worrying about work when not working

Related to worrying about work, one of the questions of Eurofound survey was: “How often in the last 2 weeks, have you kept worrying about work when you were not working?”. We think the responses to this question helped in obtaining valuable insights of how work-related concerns do persist outside of working hours and indicate potential *challenges in achieving work-life balance*. The frequency of options provided in the survey included responses such as “always”, “most of the time”, “sometimes”, “rarely” and “never”. We here consider all the responses indicating any worrying degree about work (even “rarely”) against those who answered “never”. “Rarely” worrying about work could be a valuable indicator of a certain level of concern, even if it differs from responses indicating constant or frequent worries. “Rarely” means that the person experiences work-related worries less frequently or less intensely compared to those who respond with “most of the time” or “always”.

However, these responses still suggest that there are some moments or situations where persons feel concerned about their work. Around 80.6% of respondents experienced all positive degrees of work-related worries during the lockdown period, while 19.4% did not report such concerns (“never”). These proportions remained relatively the same across the first three survey rounds until February/March 2021 (fig.5).

These findings suggest that a significant part of respondents experienced varying degrees of work-related worries during periods of lockdown, but also a year after. The persistent levels of work-related concerns could indicate the

potential impact of the pandemic on individuals' mental well-being and work-life balance (see also fig.6).

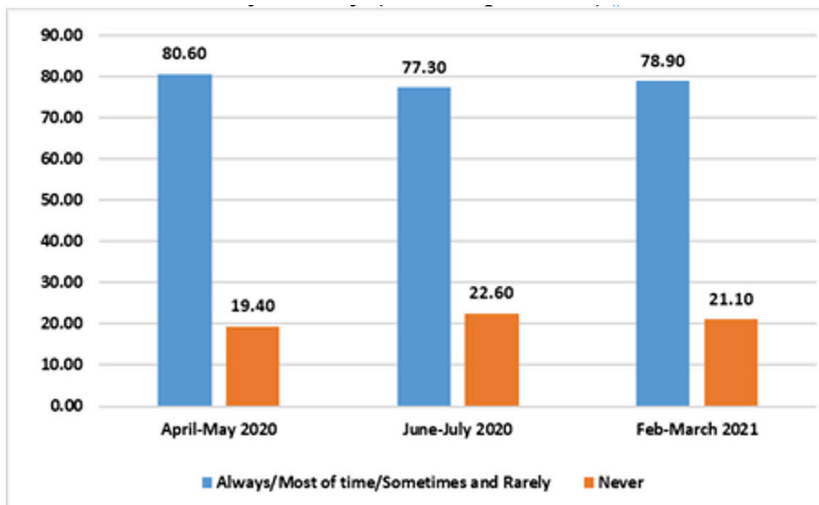


Figure 5. EU27-Employed worrying about work when they were not working by country (% of respondents)

Source: author's calculation based on Eurofound (2020)

Austria (45.7%) and Germany (30.6%) had the highest proportions of employed individuals who reported “never” experiencing work-related worries during their non-working hours from April 2020 to March 2021. For the rest of EU member countries, the percentages of respondents who indicated never worrying about work during non-working hours were significantly below 20%.

4.6. Felt downhearted and depressed

According to the Eurofound (2020) survey data, there has been a significant increase in the percentage of individuals experiencing feelings of depression and/or downheartedness during the pandemic across EU countries. During April/May 2020, 75.9% of respondents reported these emotions, which have raised one year after to 78.4% in Feb/March 2021. We categorized responses into different degrees of positive feelings (e.g., “all of the time,” “most of the time,” “more than half of the time,” “less than half of the time,” and “some of the time”) in order to a better understanding impact of pandemic on individuals' sentiments and well-being.

Negative responses, which represents the individuals who did not felt depressed and/or downhearted at any time, accounted for the remaining of the whole 100%. Analyzing individual countries, Greece recorded the highest percentage of respondents experiencing feelings of depression and

downheartedness in February/March 2021, reaching 89%, which showed an increase from 85% in 2020. Conversely, Denmark had the lowest percentage in Feb/March 2021, with 56.9%, showing a decrease from 59.8% in April 2020. These findings underscore the diverse emotional responses of individuals to the pandemic across EU countries.

4.7. The mental well-being score of individuals in the EU

Eurofound included the WHO-5 Well-Being Index questions in their survey to measure the mental well-being of respondents and assess the impact of the Covid-19 Pandemic on emotional health. On a scale of 0 to 100, the mental well-being of individuals in the EU registered its lowest level with a score of 45.3 in February/March 2021, down from 48.7 in April/May 2020. This decline was particularly higher among young people and of those who have lost their jobs (WHO-5, Eurofound 2020).

Across all EU countries, during 2020 and the first months of 2021, the mental well-being scores fluctuated around a middle value of 50 (scores below 50 on the WHO-5 scale are considered to indicate a higher risk of depression). Denmark, Finland, Netherlands, Slovenia, and Hungary recorded scores over 50 but lower than a maximum of score 61 (Denmark), suggesting a moderate risk of depression. On the other hand, Greece, Poland, and Cyprus had the lowest scores, indicating a high risk for depression. These scores were calculated based on five categories of questions, concerning individuals' self-perceptions, likely related to their mental well-being (fig.6).

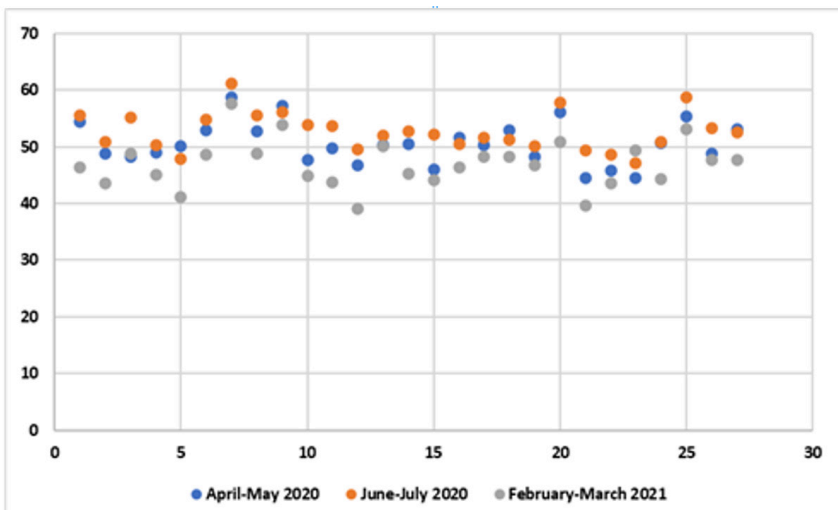


Figure 6. EU27- The World Health Organization- Five Well-Being Index (WHO-5) (score 0 to 100). Source: Eurofound(2020) based on WHO-5 questionnaires

4.8. Impact of jobs duties on family time availability

The percentage of employed respondents reporting various levels of impact of their jobs on family time availability in the EU was 73.3% during the lockdown period (April/May 2020). This percentage continuously increased at 78.1% in February/March 2021.

We here included four answers categories as “always”, “most of the time”, “sometimes” and “rarely” (based on Eurofound 2020 survey) in order to obtain a clearer image of impact proportion of jobs on family life. On the other hand, the proportion of employed individuals who reported “never” having their family time affected by job duties started at 26.7% and consistently decreased to 21.9% by February/March 2021 (fig. 7).

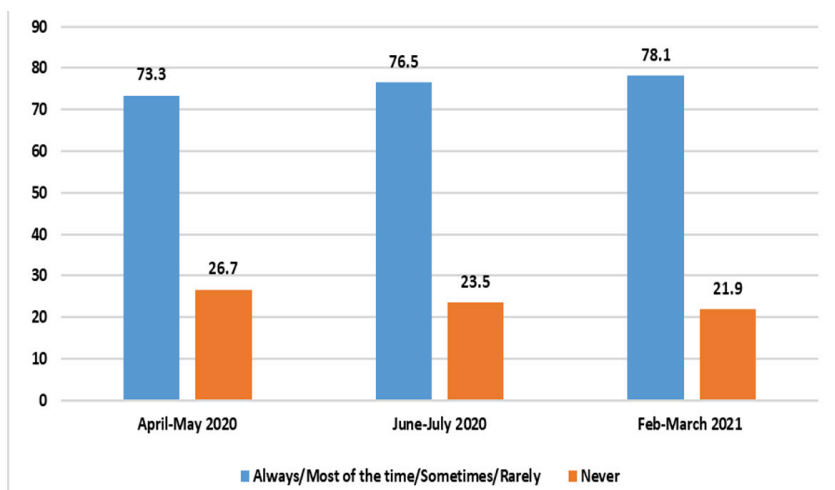


Figure 7. EU27 - Impact of jobs duties on family time availability (% of respondents). *Source: author's calculation based on Eurofound (2020)*

The impact of jobs on family time during the lockdown period and the subsequent increase can be attributed to several factors: (i) lockdown measures created significant changes in work dynamics. Many employees started to work remotely or work-from-home (fig.4), which often blurred the lines between work and personal life. As a result, employees may have found themselves attending work-related tasks outside regular working hours, and experiencing difficulties in disconnecting from work; feeling more uncertain about their jobs; feeling stressed and worried about work (fig.5). Also, during the lockdown period, traditional support systems, such as childcare services/ schools, have been disrupted or inaccessible in the majority of countries (employees with caregiving responsibilities had to perform their work tasks alongside fulfilling their family

duties). All of these have increased pressure on individuals trying to balance work and family obligations.

Among individual countries, Austria exhibited the highest increase (17.07%) in the percentage of positive responses indicating a certain impact of work duties on family time between April 2020 and March 2021 followed by Luxembourg with a 14.85% increase (we considered positive response: “always”, “most of the time”, “sometimes”, “rarely” and negative one being “never”). Anyway, the majority of EU countries observed varying degrees of increasing impact of job responsibilities on family time availability during the same period, with the exception of Denmark and Sweden, which experienced a very slight decrease of positive responses.

4.9. Impact of family responsibilities on jobs duties

During the lockdown period in April-May 2020, over half of the surveyed employees in the European Union (53.7%) provided positive responses when assessing the impact of fulfilling family duties on work responsibilities. This percentage remained relatively substantial in 2021 (52.1%), with a slight decrease noticed in June/July 2020 (49%). For the purpose of this study, positive responses were defined as those indicating ‘always’, ‘most of the time’, ‘sometimes’, or ‘rarely’, while a clear negative response of “never” was considered as a negative assessment. The trend recorded in the evolution of these responses aligns with the progression of the pandemic waves, with an initial increase in the impact of family duties on work responsibilities, followed by a subsequent decrease (fig. 8).

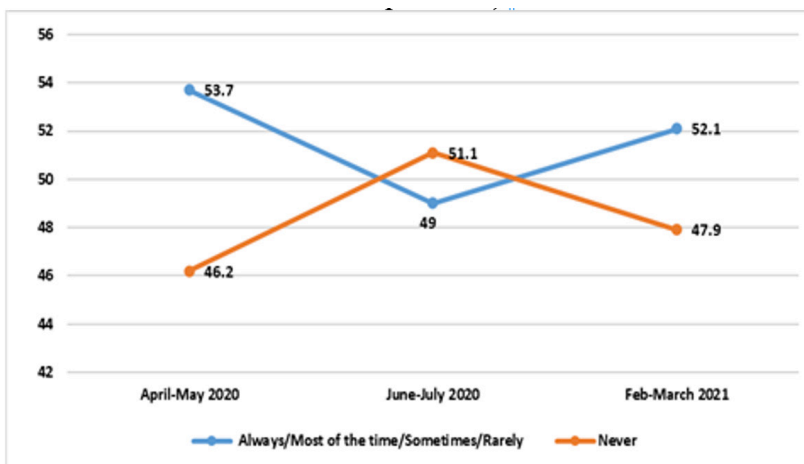


Figure 8. EU27 - impact of family responsibilities on job time allocation (% of respondents). *Source: author's calculation based on Eurofound (2020)*

The impact of family responsibilities on job time allocation among employed respondents in EU countries shows a pattern that is different from the previously discussed one related to the impact Job on Family Time Availability. While the former showed an increase during the years 2020-2021, the latter, involving family responsibilities that prevented employed individuals from allocating enough time to their work, decreased.

The increase in the impact of job on family time availability was caused by changes in work arrangements (e.g., work at home/ remote) or increased work demands (more than half of EU employed people 53-55%, worked in their time-off (every day/ every other day/once or twice a week or/ less often in order to meet work demands, between April 2020 and March 2021 according to Eurofound). On the other hand, the decrease in the impact of family responsibilities on job duties suggests that individuals have found ways to better manage their family responsibilities, together with their work obligations. It does not necessarily mean that work is more important than family, but rather reflects the changing dynamics and adaptations that individuals have made to balance both aspects of their lives. In such order they transferred some possible conflicts from job to family and from family to job in a balanced relationship.

5. Conclusions

By examining the bidirectional conflicts and factors contributing to the deterioration of this balance, the study adds to the existing body of research on work-family dynamics. Also, by examining various aspects related to work-family dynamics during the crisis, this study identifies major differences between EU member countries regarding work-family conflict levels, access to flexible work arrangements, number of hours worked during pandemic, financial situation of households and various degrees of psychological distress in individuals.

Since our previous research question asked, evidence has been found of multiple factors affecting family work relationship during Covid-19 pandemic. As anticipated, this impact was influenced by job losses as temporarily or permanently, reduced working hours, the shift to work from home for the first time, worsened financial situations, and declining individual well-being and health. The conflict between these two dimensions of life (work and family), acted bidirectionally as literature also concludes on (Frone, 2003). We found an increasing conflict from job to family and a decreasing one from family to job during 2020-2021.

We here summarize the main findings based on Eurofound large scale survey:

a) 28.2% of EU employed persons lost their jobs during the April/May (5.3 % permanently and 22.9% temporary)

b) 36.3% of EU employed persons started to work from home due to pandemic restrictions.

d) 38% of the EU employed persons experienced a worsening financial situation in April/May 2020 with an improvement in February/March 2021 (26.3% of respondents).

e) A clear impact of jobs on family time availability in the EU during the April/May, was proved by 73.3% of positive answers of EU employed persons and this percentage continuously increased till 78.1% in February/ March 2021

f) On the other hand, an impact of family responsibilities on job time allocation was remarked among employed respondents in EU countries, but with a different pattern. During April/May 2020 53.7% of the surveyed employees in the EU provided positive responses about the impact of family duties on work responsibilities attainment and a decreased but still high percentage in 2021 (52.1%).

g) 53-55% of EU employed persons worked in their time-off in order to meet their work demands.

h) 80.6% of EU employed persons experienced all positive degrees of work-related worries

i) financial challenges and uncertainty negatively affected mental health and family well-being of EU population. During April/May 2020, 75.9% of respondents reported different degrees of depression and/or downheartedness and percent raised to 78.4% of respondents in Feb/March 2021.

j) on a scale of 0 to 100, the mental well-being of individuals in the EU registered its lowest level with a score of 45.3 in February/March 2021, down from 48.7 in April/May 2020. This decline was higher among those who have lost their jobs and on young people.

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THE IMPACT OF COVID-19 ON THE DYNAMICS OF TOURISM IN ROMANIA

Gabriela BILEVSKY, PhD

Institute of Economic Forecasting, Bucharest, Romania
gbilevsky@gmail.com

Abstract: *After joining the EU, Romania tried to fulfil membership requirements, establishing its cohesion politics basis in the eight development regions, each of these having a certain specific task and a development potential that must be capitalized. This paper examines the improvement of tourism at the regional level during 1990-2022 (establishment of touristic reception with functions of tourists' accommodation and existing touristic accommodation capacity). This analysis also includes the evolution of the Tourist arrivals indicator.*

Keywords: *tourism, regional tourism, Romania, impact COVID-19 on tourism*

JEL Classification: *Z30, Z32*

1. Introduction

Tourism contributes, in general, to the creation of national incomes (GDP, GNI, NNI, etc.), to the achievement of added value including by training and stimulating production in related fields, to the circulation of liquidity and value resources, and to the increase in the level of culture and training the people.

One of the definitions of tourism is formulated by the World Tourism Organization as “activities carried out by people travelling to and staying in places located outside their place of residence for a consecutive period that does not exceed one year, for leisure, business or other reasons unrelated to the exercise of an activity remunerated from within the visited place”.

In Romania, tourism is a field with continuous development possibilities due to unexploited or insufficiently valued tourist resources. Tourism generates a specific demand for goods and services, which generates an increase in their production. Since tourism is a distinct branch of the economy, which interacts directly with other economic branches, the result is a chain growth.

To carry out activities in tourism, products are needed from the domains of transport services, accommodation, food, entertainment, health, culture and public safety, which are related to the productive branches of the food industry, construction, transport and agriculture, through which they positively influence the workforce use.

In the last decades, in Romania, efforts have been made for the development of tourism, while a series of guides, policies and strategic documents have been developed that have also financially supported this sector. However, some niche tourism segments have developed more: agritourism, medical and spa tourism, and city-break tourism

2. The evolution of tourism in Romania, at the regional level

Romania has an important tourist potential, which is obviously an advantage for its South-East region (Black Sea Coast and Danube Delta), characterized however by seasonal tourism, compared to other regions (Bucharest-Ilfov, Centre), which develop other forms of tourism (business, cultural, monastery, weekend, etc.).

The evolution of the tourism sector is described using the analysis of the main specific indicators and is based on official data provided by the Romanian National Institute of Statistics. In this study, the analysis of indicators at the regional level covers the period 1990-2022, with a special focus on the years 1990, 1995, 2000 and the year of EU integration, 2007; the years of the financial crisis 2008, 2009 and 2010; then 2015, 2018, 2019 to study the phase before C19; followed by the health crisis in years 2020, 2021 and then the year 2022.

2.1. Establishment of touristic reception with functions of tourists accommodation

Tourist reception structures start from a total number of 3213 per country in 1990, when the South-East region, with 936, had the largest number, followed by the Center Region with 762. Their number experienced a positive long-term evolution, but with a change in trend at two moments.

The first moment is after the liberalization of the Romanian economy, a decrease in 1995 with a number of 308 structures, up to 2905 structures in total, but this was felt in all regions (figure 1).

In 2007, the year of Romania's EU integration, there was an increase in the number of tourist reception structures across the country by 50% to 4694, in the South-East region by 21.3%, and in the Central Region by 62.9 % up to 1209 structures, approaching equality with the South-East Region (figure 1).

The second distorting moment, strongly influenced by the economic-financial crisis of 2008-2010, represents a sudden drop in 2015, in the South-East Region of 20% to 1111 structures, being surpassed by the Center Region which has 2107 structures (figure 1).

At the time of the Covid crisis in 2020, there was an increase in the total number of tourist structures at country level by 2.5%, up to 8610. This increase continued in 2021 by 36% and by 3.9% registering 12201 total accommodation structures. At the same time, this growth was manifested at the maximum level in the North West region, with an increase of 8.99% in 2020 compared to 2019, in the midst of the pandemic, continued with a 42% increase in 2021 compared to 2020 (figure 1).

The increase from 2020 in the number of accommodation structures was also manifested in the North-East Region, with 7.2%, continued in 2021 with 30% compared to 2020 (figure 1).

But the most spectacular increase in the pandemic is recorded in 2021 compared to 2020, in the South-East Region, by 64%, representing 934 accommodation units, up to a number of 2393 units (figure 1).

However, in 2022, the Central Region has the largest number of tourist structures, with 3054 units, representing 25% of the total for the country, of 12201 tourist reception structures (figure 1).

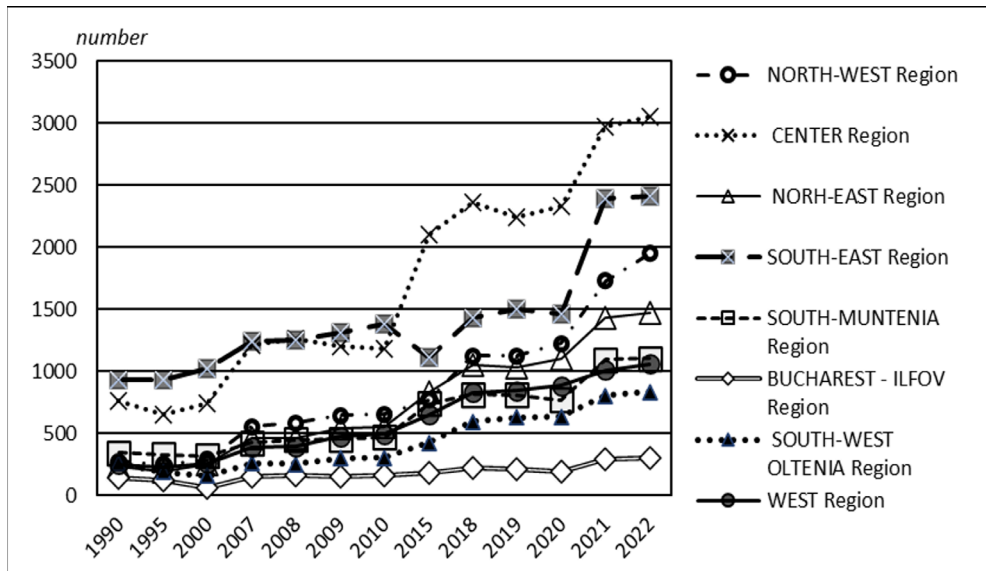


Figure 1. Establishment of touristic reception with functions of tourists accommodation. *Source: Processing of online statistical data from TEMPO_TUR101D, National Institute of Statistics*

Notes: Establishment of touristic reception with functions of tourists accommodation include hotels, youth hotels, hostels, apartment hotels, motels, tourist villas and cabins, tourist and agro-tourism guesthouses, campsites, holiday villages, bungalows, school and preschool camps and ship accommodation.

2.2. Existing touristic accommodation capacity

In 1990, Romania had a number of 353,236 tourist accommodation places. In terms of structure, hotels have the largest share in accommodation capacities with a number of places of 167,979, representing 47.6% of the total, followed by tourist villas with 46,757 (13.2%), student and preschool camps with 46,598 places (13.2%), campsites with 46,473 places (13.1%) and others (National Institute of Statistics, processing from online statistical data TEMPO_TUR102D).

In 1990, the South-East Region had 46.1% of Romania's tourist accommodation capacity, especially in the resorts on the Black Sea coast (figure 2), followed by a 12.5% share in the Center Region, the others regions holding a share of up to 10%, and the fewest places were in the Bucharest-Ilfov Region with a share of 3.6%.

In 2007, there was a 20% decrease in tourist accommodation places across the country to 283,701 places from 353,236 places in 1990, valid for all regions. The biggest reductions are in the South-East region with a decrease of 26.3%, which represents 30 thousand places compared to 1990, and in the Center Region with 20%, representing approximately 9 thousand places (figure 2).

In 2015, at the regional level, there was an increase in accommodation places, represented by a 16% increase for the country as a whole compared to 2007, reaching 328 thousand places. Significant increase also in the Center region by 94% compared to 2007, representing 32 thousand places and in the North-West Region by 20%, representing 5.5 thousand places (figures 2). At the same time, in 2015, the second massive reduction in accommodation places was recorded only in the South-East Region, by 24% compared to 2007, representing 32 thousand places (figure 2).

At the time of the COVID-19 crisis in 2020, there was a stagnation of approximately 355 thousand places in the total number of accommodation places in the country compared to 2019.

In 2021, there is a country-wide increase in accommodation places by 14.5% compared to 2019, and by 2.9% in 2022 compared to 2021. This increase was seen across all regions in 2021, but, especially in 2022, it was at the maximum level in the North West region, with a 30% increase compared

to 2019, and with a 22% increase in the North-East Region, 21% in the South-East and 18% in the Center Region, in 2022 compared to 2019 (figure 2), based on increases in tourist accommodation structures (figure 1).

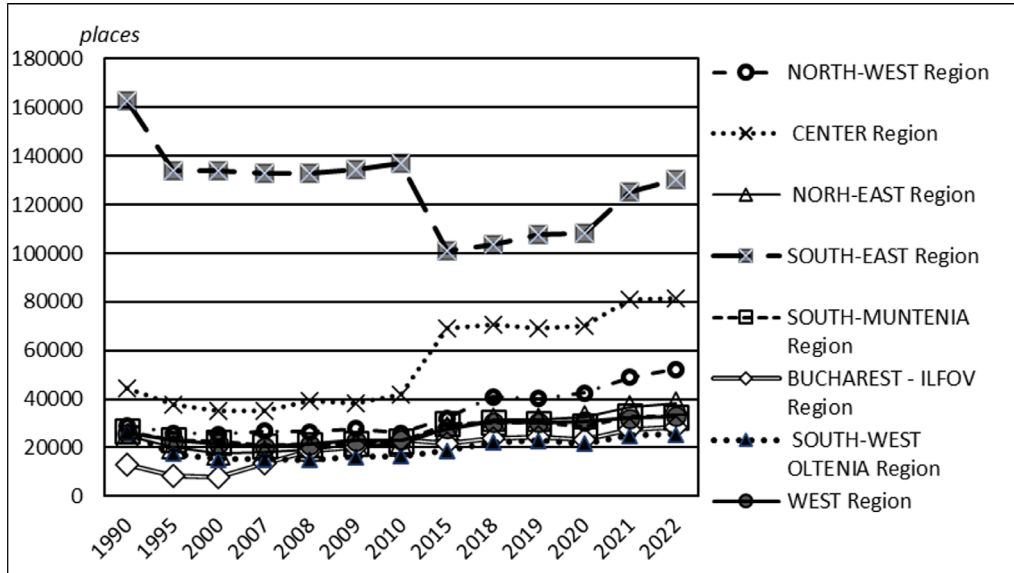


Figure 2. Existing touristic accommodation capacity

Source: Processing of online statistical data from TEMPO_TUR102D, National Institute of Statistics

Notes: The tourist accommodation capacity represents the number of tourist accommodation places registered in the last act of reception.

3. The evolution of the Tourist arrivals indicator

In the period 1990-2000, the tourist activity expressed with the help of the tourist arrivals indicator had a sharp downward trend at the national level from 12296 thousand arrivals to 6073 thousand arrivals, followed by a period with notable fluctuations and differences from one region to another (figure 3). In the same period, at the regional level, the South-East Region, where there are the most arrivals, saw a decrease of 59% in 2000 compared to 1990 and of 48% in the Center Region (figure 3).

Between 2000 and 2010, the number of arrivals in accommodation units in Romania decreased by over 15%. The weakening of the competitiveness of the tourist infrastructure in Romania led to a decrease in arrivals in all regions, by up to 50% compared to 1990, in the context of Romanian tourists having

the possibility of traveling abroad, especially after joining the European Union. However, in 2007, approximately 6.9 million arrivals were registered in Romania, of which approximately 1.55 million are foreigners, representing 22% of the total (figure 3).

Until 2009, the first place in the number of tourist arrivals was held by the South-East region with 1.2 million arrivals, due to its coastal but seasonal tourist potential. After this year, the first place is taken over by the Centru region, with over 1.13 million tourist arrivals, as a result of massive investments in tourist structures. It is worth noting that, starting from 2015, the second place is the Bucharest - Ilfov region, which attracts tourists, as a result of the fact that there is an important sector of business services here (it is the region that in 2014 registered an increase of 13.4% compared to 2013, but also a significant increase of 45.6% compared to 1990).

The least attractive region, from the point of view of tourist arrivals, is the South-West Oltenia region throughout the analysed period (figure 3), with the lowest number of arrivals, reaching up to 337 thousand arrivals in 2010, but with a return to 791 thousand arrivals in 2019 growth.

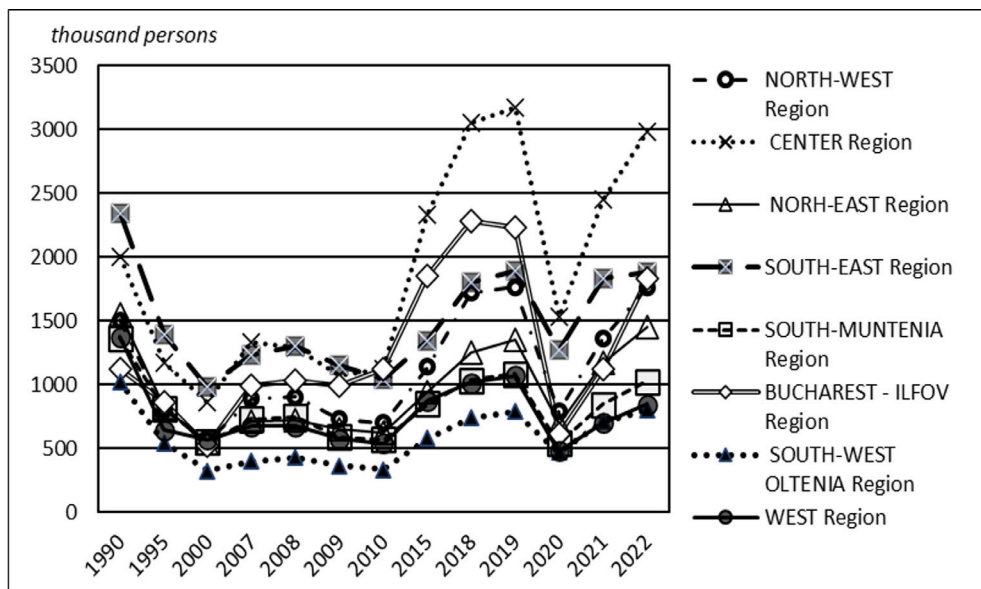


Figure 3. Arrivals of tourists

Source: Processing of online statistical data from TEMPO_TURI04B, National Institute of Statistics

Note: Arrivals represent the number of tourists staying in tourist accommodation units (Romanians and foreigners) who travel outside the localities where they have their

permanent residence, for a period of less than 12 months and stay at least one night in a tourist accommodation unit in visited areas of the country.

In 2019, the most arrivals were recorded in the studied period, in the Center region, with 3.2 million arrivals, representing a share of 22.3% of the total arrivals per country in that year.

If we study the composition of foreign and Romanian tourist arrivals, we notice that the share of foreign tourist arrivals is returning to 22.6% in 2007 (1550 thousand people) followed by unfavourable situations, for example in 2009 with a share of 20.6% (with arrivals of 1276 thousand people) (figure 4).

However, the foreign tourist arrivals indicator recorded a constant increase in the number of foreign tourist arrivals over the years until 2019 to 2.68 million people, with 92.3% in 2019 compared to 2010 (figure 4).

Approximately half of these arrivals (48.1%) are in the Bucharest-Ilfov region, 1.22 million, in 2019, as a result of the promotion of weekend, cultural and business tourism (increasing from 37, 3%) (figure 4).

The main reason for foreign tourists' visits is leisure, followed by transit, business or day trips.

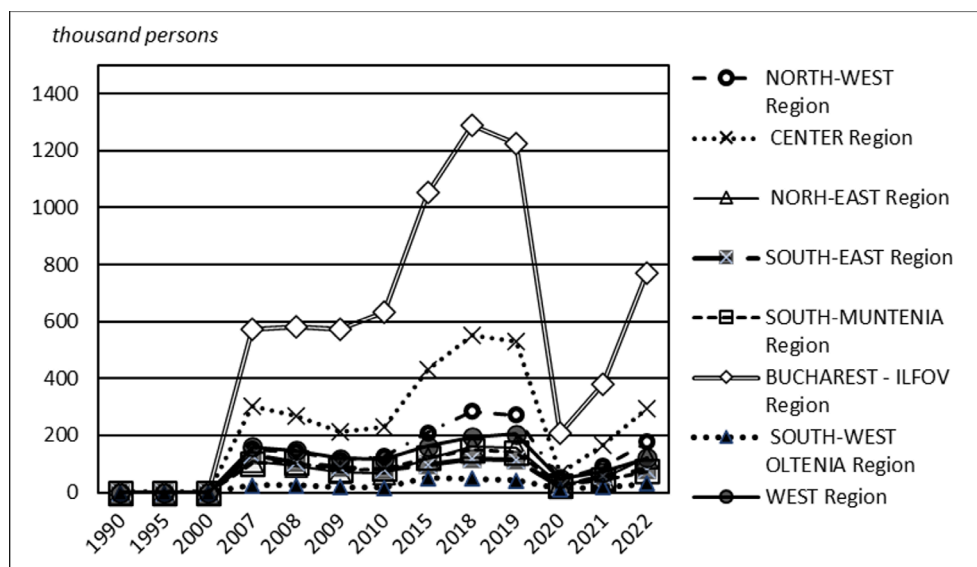


Figure 4. Foreign arrivals

Source: Processing of online statistical data from TEMPO_TUR104B, National Institute of Statistics

In 2021, there were 8.53 million arrivals of Romanian tourists in accommodation units, with 19.0 million overnight stays, but also 843

thousand arrivals of foreign tourists and 1.83 million of their overnight stays in accommodation units. Romanian tourists represented 91.0% of total arrivals and 91.2% of total overnight stays, which proves that Romanians are the main source market for Romanian tourism (figure 5).

Among foreign tourists, Europeans registered 1.4 million overnight stays in Romania in 2021, representing 76.7% of the total international overnight stays and 6.8% of the total overnight stays, representing more than a quarter of the total foreign tourist arrivals.

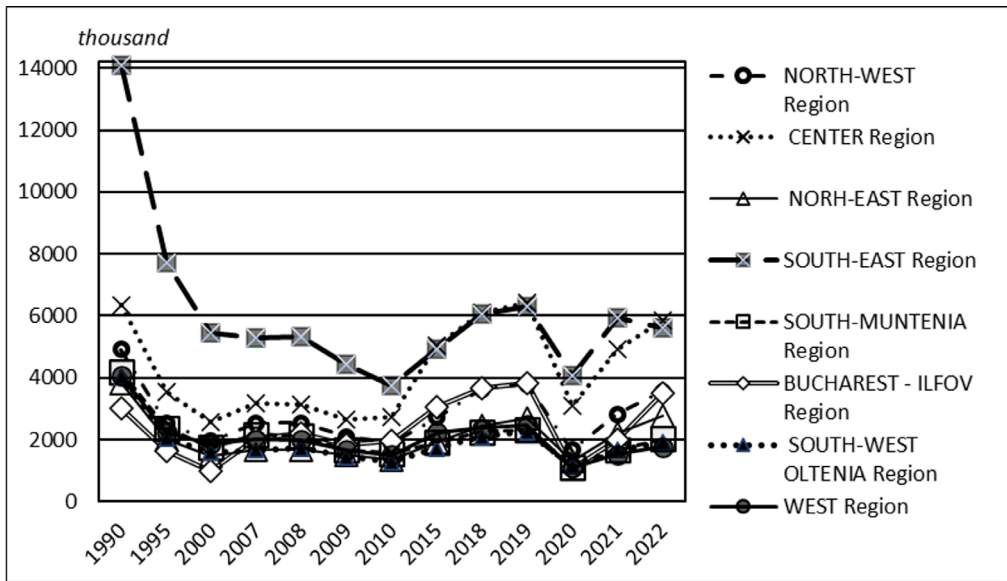


Figure 5. Tourist overnight stay

Source: Processing of online statistical data from TEMPO_TUR105D, National Institute of Statistics

Notes: The tourist overnight stay is the 24-hour interval, for which a person is registered in the tourist accommodation space and benefits from hosting.

Conclusions

The South-East region has a special tourist potential, in particular, due to the presence of the Romanian coast of the Black Sea (with 70 km of coast between Năvodari and Mangalia) and the Danube Delta. Thus, Romania’s access to the Black Sea created conditions for the development of coastal tourism, the 13 existing resorts concentrating almost half of the existing accommodation, treatment and leisure capacity at the level of the entire country (42.7%)

Accommodation structures on the Black Sea coast are mainly concentrated in the coastal area, with limited opportunities for expansion.

At the time of the COVID-19 crisis in 2020, there was an increase in the total number of tourist structures at country level by 2.5%, up to 8610. This increase continued in 2021 by 36% and by 3.9% registering 12201 total accommodation structures. At the same time, this growth was at the maximum level in the North West region, with an increase of 8.99% in 2020 compared to 2019, in the midst of the pandemic, continued with a 42% increase in 2021 compared to 2020.

Starting with 2010, there are major increases in the number of accommodation structures for the Center Region (figure 1) of 27% compared to 2009, reaching the highest number of tourist structures owned by a region. In 2022, the trend is maintained, with the Central Region having the largest number of tourist structures, with a number of 3054 units, representing 25% of the country's total of 12201 tourist reception structures.

In the distribution of tourist arrivals in recent years, there is a sharp reversal of the situation by region in 2015, in which the most tourists are registered in the Central Region, followed by the Bucharest-Ilfov Region and the South-East Region only in third position.

The effect of the 2020 COVID-19 pandemic crisis can best be seen on arrivals which decrease by 52% and overnight stays by 51%, when they actually collapse. The receipts are also greatly reduced and that is why the government of that period supported the sector, by providing grants and incentives for private sector investments (e.g. the "Start-Up Nation" Program). In order to mitigate the shock produced by the COVID-19 pandemic, certain state aid schemes have been created, some of them directly or indirectly targeting the tourism sector. They supported the return to 10.2 million tourist arrivals in 2021, with an increase of 59.5% compared to 2020 and to 12.5 million tourist arrivals in 2022 with an increase of 23.4% compared to 2021. However, foreign tourist arrivals, although they have an increase of 93.7% in 2021 compared to 2020 and 90.5% in 2022 compared to 2021, reached a number of 1.675 million arrivals in 2022, representing only 59.8% of foreign tourist arrivals in 2019. However, Romania has a great potential for attracting international tourists and increasing the share of tourism in the economy.

Investments in transport infrastructure support the development of tourism. The completion of major road infrastructure projects must be one of Romania's priorities in the coming years. With adequate management, with the involvement of local bodies, tourism represents a means of education, raising the level of training, culture and civilization of the people.

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