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SECTION ECONOMICS, BUSINESS ADMINISTRATION, TOURISM AND STATISTICS

THE IMPORTANCE OF PUMPKINS AND OIL GOURDS IN ROMANIA

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Abstract: In my article, I chose one group of cucurbits, the oil pumpkin. The pumpkin can be considered an old cultivated plant dating back hundreds of years, but the importance of the oil pumpkin can be traced back to the last 10 years. My goal in writing this article is to point out the importance of pumpkin seed oil and to highlight its beneficial effects in addition to emphasizing a healthy lifestyle. In Hungary, pumpkin seed oil is more important in the western part of the country's border (Vas and Zala counties), while in Romania it is in Cluj County and the surrounding areas, as well as the territorial units of Bucharest. In addition to its characteristic delicious taste, pumpkin seed oil is also considered healthy, as it is considered one of the best immune-boosting substances. Pumpkin seed oil is also beneficial for preserving masculinity, preventing prostate problems, and stomach and digestion problems. After presenting the cultivation conditions of pumpkin seed oil, I present the production possibilities of pumpkin seed oil and the market prospects of pumpkin seed oil from the perspective of Romania.

Keywords: *energy, pumpkin, consumption, production, pumpkin seed oil*

JEL classification: O13

Generally, Introduction or Background - The cultivation conditions of olive gourds

Based on the literature review, it can be seen that pumpkins originate from the American continent and that they were already cultivated in pre-Columbian times (Antal, 1992). Among the many types of pumpkins, in my article I deal with the oil pumpkin (*Cucurbita pepo* convar. *pepo* var. *styriaca*). Due to its beneficial effects, it is excellently suitable for families/persons following a healthy diet, since according to oral tradition, pumpkin seed oil has a healing effect (as a result of which its popularity is increasing). In both Romania and Hungary, its consumption is slowly spreading, as all products produced from oil gourd represent a high price category. This is also the reason why pumpkin seeds and pumpkin seed oil are mostly exported in both Romania and Hungary.

Romania's territorial characteristics are suitable for the cultivation of olive gourds, since olive gourds are heat- and light-demanding, moderate water-demanding and shade-tolerant plants (they are not demanding on the soil, they can be grown in all arable areas). It yields the largest amount on calcareous or neutral, quickly warming, humus sand (sandy loam) and on looser chernozems. A soil temperature of 12 °C is required for the germination of olive gourds, and the optimum for fruit formation is 25-28 °C. In the early stages of its development, it is very sensitive to frosts, but in autumn the ripe fruit is not damaged even at -3 and -4 °C. Since corn is also cultivated in many territorial units in Romania, this plant can be a complementary plant in crop rotation, as it can also be a companion plant to corn in intermediate cultivation. Its water requirement is greatest during flowering and fruit formation, and it appreciates watering when the flower is in bud, so water applied during drought (end of June and mid-July) can have a significant yield-increasing effect. Depending on the cultivated variety, the cultivation period is 130-150 days.

The gourd is a nutrient-demanding plant, as the need for P₂O₅ and K₂O is significant even during the seed production period. Nitrogen appreciates fertilizing, but an overdose can cause disease hypersensitivity and seed set problems. I have summarized the nutrient requirements of butternut squash in Table 1.

Table 1: Nutrient requirements of butternut squash at different nutrient supply levels

Cultivation site in arable land	Active ingredient (kg/t)	Nutrient supply of the soil				
		very weak	weak	medium	good	really good
I.	N	78	65	55	47	41
	P ₂ O ₅	40	38	35	32	30
	K ₂ O	125	105	90	85	80
IV.	N	84	73	65	57	52
	P ₂ O ₅	49	44	40	37	35
	K ₂ O	130	110	90	85	80

Source: My own editing based on the data of Antal (2000).

It is not demanding on the previous crop, but it is very sensitive to pesticide residues. Due to its wide space, it is considered a weed-growing culture, so attention must be paid to the weeding effect of the pre-crop. Its best pre-crops are: eared cereals (after pumpkins, any spring-sown plant can be grown successfully, except green vegetables). What is important to pay attention to is that it cannot be planted for 4-5 years after itself due to agrotechnical reasons (Dutka, 1998).

The most common weeds occurring in oil gourd culture are: libatop and pig's sedge, ragwort, cock's-foot grass, and various species of fly ash and bitter gourd (Ragasits, 1994). The most significant pests of pumpkins are: various soil-dwelling insects, nematodes, the common spider mite, the cucumber, black beet and green peach aphids (Vecseri – Horváth, 2001). In addition to viruses, the most common diseases in olive gourds are powdery mildew, downy mildew, fusarium wilt, colletotrichum and

cladosporium (Késmárki – Kuroli, 2002). Since oil gourd is resistant to fungal diseases, chemical protection is not recommended.

Harvesting pumpkins depends on the purpose of cultivation. In the case of gourds grown for oil extraction, harvesting is extremely labor-intensive and requires a lot of attention. In order to achieve a good (excellent) quality final product, it is important to obtain a product with a low water content, ready for pressing, as soon as possible after the beginning of the harvest.

In the beginning, seed cultivation with shell, later seed without shell, was typical in Romania. The unshelled seeds are dark green, whole, and weigh 100-500 grams per thousand seeds, depending on the variety. Pumpkin seeds can be stored in a cool, dark place for a long time without going rancid, they usually contain 40% oil. Its oil has a darker greenish-yellow color and belongs to the semi-dry oils. About a quarter of it is saturated (palmitic and stearic acid), and the rest is unsaturated (linoleic and oleic acid).

Production possibilities of pumpkin seed oil

In Hungary, mainly in the villages of Zala and Órség, while in Romania in Cluj county and around Bucharest, the production of solid oil is of greatest importance. In both countries, the cultivation of pumpkins and the pressing of pumpkin seed oil from pumpkin seeds go back to a tradition of approximately one hundred years. In the beginning, farmers grew pumpkins with pumpkin seeds in their shells, but nowadays farmers have switched to pumpkin seeds without shells. The goal in the production of pumpkin seed oil is to extract fine and premium oil from the valuable seeds.

Oil can be produced from pumpkin seeds using two processes (cold pressing and hot pressing). In the case of warm pressing, the seeds collected from the pumpkin are first washed, then dried, and the product is sent to the pumpkin seed oil press, where the seeds are first ground, and then the ground material is mixed with salt and water. In addition to the addition of water, they are roasted over a fire in a metal pot and the lightly roasted mince is put into a pressing press, which squeezes out the precious oil. The aim is for the finished material to be clean and to be sold free of all substances. The end result is a particularly characteristic substance (viscous liquid), which has a silky taste, in many cases it has a taste reminiscent of walnuts. The smell is spicy, with a characteristic aroma, and the color is very dark green. A significant part of its fat content (approximately 55%) is polyunsaturated fatty acids. The other technology is cold pressing. The essence of this is that cleaned and dried seeds are squeezed out using a closed press. This technique is used because they can produce a much more valuable oil in terms of physiological effects. In this case, there is no high temperature, no added additives, only 100% pure, naturally pressed, deep green-reddish-brown oil, which preserves the vitamin and mineral content of the oil thanks to the cold storage technology.

Of the two technologies, the aroma of cold-pressed pumpkin seed oil is more natural, and more vitamins remain in the final product. However, the disadvantage is that it can be produced in smaller quantities. Oil made with this technology is mainly used for salads (salad oil), and thanks to the approximately 25 types of alkaloids in the oil, it has a "robotic", anthelmintic and anti-inflammatory effect. A larger quantity can be

produced from hot-pressed pumpkin seed oil, since with this technology the oil is extracted by adding salt and water. The taste of the product obtained by warm pressing is more delicious (this product sells better among consumers).

The use of the seed meal remaining during oil pressing is also significant, as it can be used in several sectors: (1) it can be used as a raw material for the confectionery industry, (2) it is one of the basic elements of concentrated protein feed, (3) cooking vegetables, baby food, and pickles can also be made from the semolina made from the fruit of the seed. Of course, in animal husbandry, it also plays a significant role in the feeding of cattle, since when fed during the pregnancy period, due to its high vitamin E and β -carotene content, it can contribute to the improvement of reproductive biological indicators.

Overall, it can be concluded that a very tasty oil can be made from pumpkin seeds, which has many beneficial effects on hair and skin. In many cases, it is also recommended to improve circulation, and it also alleviates the symptoms of menopause and prostate diseases. In some specialist literature, I have come across pumpkin seed oil as a "miracle for masculinity". Based on previous studies, 2.5 kg of pumpkin seeds are needed to produce 1 liter of high-quality pumpkin seed oil.

The price of pumpkin seed oil

The price of pumpkin seed oil (as well as all other foods) showed a continuous increase. In the year 2021, based on the FAO database, the producers asked for 3-5 euros per bottle. Despite its high price, more and more areas are trying to introduce the production of pumpkin (pumpkin seeds) into the production structure. The drought of 2022 resulted in a lower yield for this crop as well, as a result of which the price of pumpkin seed oil increased greatly by the end of 2022. By way of comparison, I mention that in the last 12 months, compared to August 2021, the price of food has increased by 30.9% (Babrik, 2022). Based on the KSH database, the largest increase was observed in the case of the following products compared to August 2021 data: margarine (+66.9%), bread (+64.3%), cheese (+61.0%) , dry pasta (+57.9%), dairy products (+54.7%), butter and butter cream (+54.5%), pastries (+45.4%), eggs (+42.0 %), rice (+40.9%), poultry and confectionery flour (+40.4%). After examining the data, I was surprised to find that the small increase occurred in the price of potatoes, fresh vegetables, and fruit.

Pumpkin production and its market

In Hungary, pumpkin seed oil was first dealt with at the western border (Vas and Zala counties), but now, in addition to Transdanubia, the Great Plain and the Northern Hungarian region are also becoming increasingly important. Production started to increase in the Great Plains and the Northern Hungarian region because it is possible to carry out pressing in these territorial units as well. One of the receiving markets for pumpkin seed oil produced in Hungary and Romania is Austria, followed by Slovenia.

Due to the pandemic situation and the war situation, those Austrian oil producers who were unable to produce due to the drought and were unable to procure the seeds from Ukraine, in 2022 and 2023, the territories of Hungary and Romania can provide the missing amount. However, buyers also have to take into account that due to the drought, less quantities are available in both Hungary and Romania (and the available quantities are available at a higher price).

In a subsequent part of the analysis, I examined Romania's gross production value for pumpkin and butternut squash products (Figure 1). Gross production value refers to the total production value during a specific period of time, which can be used to characterize a sector for a given country. Based on the calculation, it is the sum of the net sales and the capitalized own performance (the change in stock of own-produced stocks and the capitalized value of the own-produced assets together).

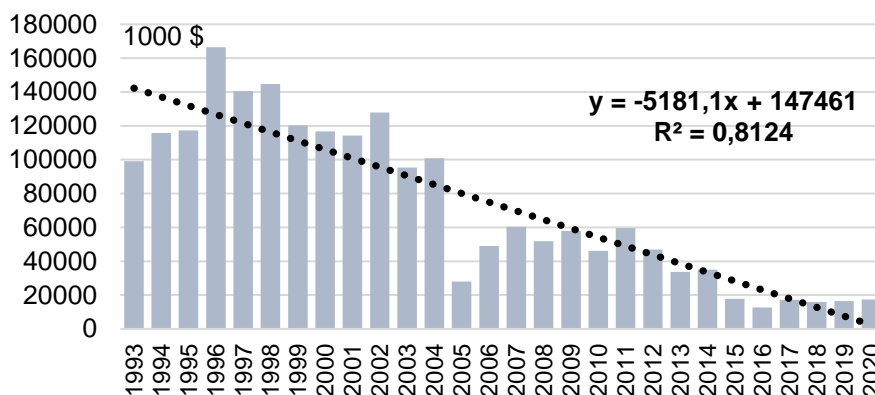


Figure 1: Development of the gross production value in Romania for pumpkin and butternut squash products from 1993 to the present day

Source: Own calculation based on FAO.org data

In the case of commercial activities, this value must be reduced by the purchase value of the goods sold, and in the case of other service activities by the value of the mediated services. Calculation of gross production value:

Net sales

- purchase value of goods sold

- mediated services

+ Capitalized value of self-produced assets

+/- Stock change of self-produced stocks

Gross production value

As a result of the analysis, it can be concluded that from 1993 to 2020, an average annual decrease of 6.23 percent occurred. It can be established with 81.24% certainty, taking into account past data, that the gross production value from pumpkins and oil pumpkins in Romania will decrease by an average of 5 million USD per year.

European Union overview of the situation of olive oil

Based on EUROSTAT statistical data from 2019, the largest number of pumpkins (or pumpkins) in the European Union are in France (129 thousand tons), Spain (129 thousand tons), Germany (86 thousand tons), Portugal (72 thousand tons), Poland (68 thousand tons) and were produced in Romania (21 thousand tons) (Figure 2). In the case of each of the listed countries, an average increase of 5-7% can be observed compared to the base year of 2010 (with the exception of Romania, since there was an average annual decrease of 13% from 2010 to 2019). Among the European Union member states, compared to the 2010 base year, the largest increase occurred in Spain, which is due to continuous developments.

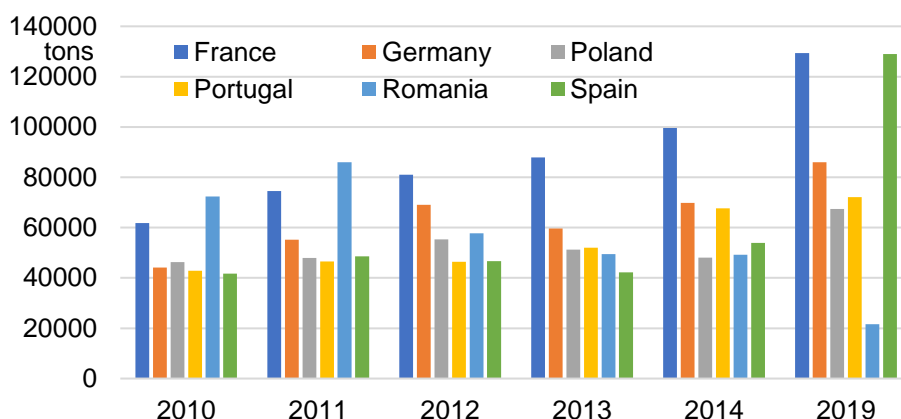


Figure 2: Evolution of the size of the harvested area of oil gourd in the most important oil gourd producing countries

Source: Own calculation based on FAO.org data

In the European Union in 2019, approximately 25,000 hectares of pumpkins or pumpkins were produced (Roman Journal, 2020). Spain had the highest harvested area in 2019 (approximately 10,000 hectares). It is followed by France (5.5 thousand hectares), Germany (3.8 thousand hectares) and Portugal (2.2 thousand hectares) with almost half the harvested area (Figure 3).

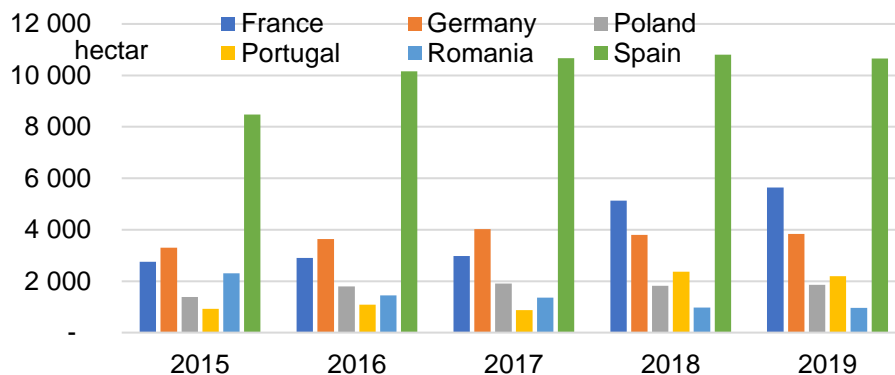


Figure 3: Changes in the size of the harvested area of oil gourd in the most important oil gourd producing countries

Source: Own calculation based on FAO.org data

In order for the European Union to have the necessary amount of pumpkins for the processing industry, 31 thousand tons of pumpkins were imported from countries outside the European Union in 2019. This value is approximately 81% higher than the volume 10 years ago. The largest part of the import volume came from South Africa (approximately 17%), followed by Panama and Morocco (with a share of 11-10%). The quantities of pumpkins in the United Kingdom, Argentina and Brazil are also slightly behind, but significant, accounting for 8-10 percent per country in 2019. Pumpkin varieties that were not used by the European Union are imported to countries outside the European Union. The most important importing country has been Spain for years, as this country accounts for almost 36% of the volume delivered to countries outside the European Union. Spain was followed by Portugal (30%), France (12%) and Greece (10%). Based on the 2019 EUROSTAT data, 22,000 tons of pumpkins (oily pumpkins, pumpkins) were exported to one of the countries outside the EU. This value is among the 10 it was 64% more compared to 2019. The United Kingdom accounted for almost 2/3 of the importing countries in 2019, followed by Switzerland (16%) and Israel (11%).

The situation of pumpkins, olive pumpkins and pumpkins in Romania

I took into account the Romanian pumpkin, pumpkin, and pumpkin data based on the Selina Wamucii databases. In some cases, I also used the values in the Eurostat and FAOSTAT databases. When searching for data, I found data on pumpkins in the following category: Fresh or chilled pumpkins, squash and gourds "Cucurbita spp." (HS code 070993).

Based on the FAOSTAT database, I looked at the role of pumpkin in Romania over a long period of time. It can be clearly seen here that the historical peak was recorded in 1961, when the amount of pumpkin produced was 1,823 thousand tons (of course, this only includes consumption-based pumpkins). Its importance shows a continuous

decrease. Today, the amount of pumpkin produced barely reaches 19,000 tons (Figure 4).

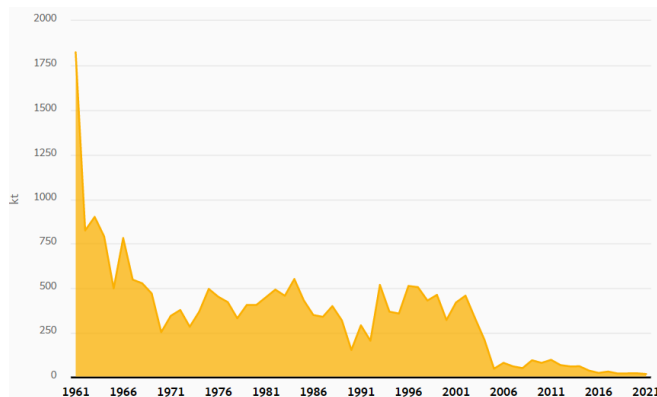
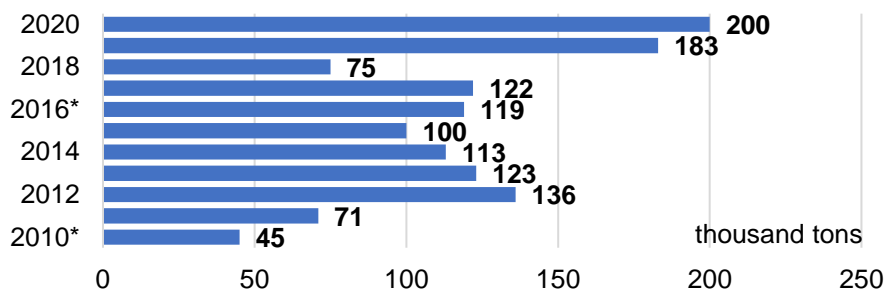


Figure 4: Production of pumpkins (oil pumpkins, pumpkins) in Romania from 1961 to the present

Source: Figure based on FAOSTAT data

In 2019, approximately 22,890 tons of crops were produced from the 1,350-hectare area in Romania, which showed an increase of 3% for the year 2020 (almost the same area size). Based on the 2021 FAOSTAT data, there was an 18% decrease compared to the 2021 harvest, so the size of the total harvest was 19,300 tons. In terms of exports, based on the 2019 data, we can talk about 183 thousand tons of pumpkins, butternut squash and pumpkins (Figure 5). This value is 44% higher than the quantity exported in 2018.



*: Adjusted values

Figure 5: Export quantity of pumpkin in thousands of tons to countries outside the European Union in 2019

Source: Own compilation based on Selina Wamucci and Eurostat data

The amount of exports in 2019 amounted to 140 thousand dollars, which was 70% higher compared to the value of 2018. Of course, this export value was higher for the years 2020, 2021 and 2022, as a liter of pumpkin oil represented a higher value on the market due to the drought and pandemic closures.

The UK, Latvia, Bulgaria, Moldova and Greece have been considered the most important buying markets in Romania for years.

In the year 2021, the countries producing the largest amount of pumpkins and pumpkins in the world were: China, India and Ukraine. These 3 countries accounted

for approximately half of world production. Of course, thanks to the war, the amount of pumpkin production in Ukraine will also decrease by 2023.

According to Indexbox's survey, based on past data, the size of the pumpkin market in Romania is predicted to stagnate or decrease by 2023. Since, in addition to advanced technologies and tested seeds, unfavorable weather is also a big source of risk in terms of crop area and crop volume, therefore the prepared forecasts can only be accepted with great uncertainty. Compared to the 2020 data, the Romanian pumpkin market showed a 9.5% decrease for the years 2021 and 2022 as well. In addition to the decrease in the quantity produced, consumption also fell. Based on the data of the last 10 years, Romania can boast the highest pumpkin harvest in 2012 (since then a decrease has been observed). In 2021, the average yield of pumpkins and oil gourds increased per hectare thanks to continuously developed seeds (a 2.5% increase compared to the base year of 2020). It is also due to this that, based on the data of the last 10 years, the average annual growth rate of the yield indicator is 2.8%.

Since more than one type of pumpkin is used in each country, it is possible to talk about both export and import in the case of Romania. In terms of value, Turkey can be considered the most significant country among Romania's suppliers, as this country accounted for 65% of the total import volume in recent years. The next country with a large gap is Germany, which accounted for approximately 18% of the volume of milk imports, followed by Spain with 4.5%. Based on last year's data, the average import price for pumpkin/oil squash was \$909 per ton (in contrast, the export price was around \$1,100 per ton during the same period).

In conclusion

After reading the article, it is clear that Austria (more precisely, Styria) has been the most important producer and user of pumpkins for the last 10 years. This is where the cultivation of pumpkins originated in Hungary and Romania. In Hungary, it is more important in Western Transdanubia, while in Romania it is more important in the areas around Cluj County and Bucharest. In Austria, pumpkin seed oil is mainly used for meals, as pumpkin seed oil is rich in polyunsaturated fatty acids. In Hungary and Romania, the dietary use is to a lesser extent, instead, consumers mostly use its medicinal effects. (in the form of a dietary supplement). During the review of the literature, it can be seen that when pumpkin seed oil is consumed, harmful cholesterol levels in the blood can be reduced, and bladder and prostate complaints can also be improved with it (the pharmaceutical industry recommends pumpkin seed oil capsules for the treatment of urinary tract complaints).

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EXAMINATION OF ROMANIA'S ROAD NETWORK IN THE LAST 5 YEARS

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Abstract: *The development of transport can be traced back to the Middle Ages. The plants and manufactories involved in the production of products mainly satisfied local needs. Later, however, with the increase in production volume and the saturation of local needs, the production manufactories sought new markets for themselves. In the beginning, the merchants themselves carried out the delivery of the goods, but the work of the merchants was constantly expanding, and thus it became necessary to use transport companies. In our article, we examine the current situation of road transport in Romania in the last 5 years regarding public roads and highways. We examined the length of the roads in Romania and what place it occupies within the European Union.*

Keywords: *road network; transport; European Union; truck*

JEL classification: L91, N70

1. Generally, Introduction or Background - Importance of transportation

Transportation is an important area of the logistics discipline, during which materials and goods flow between economic units, and as a result, the location of raw materials/products changes. (Kovács – Pató, 2007).

Many people mistakenly use the term transportation as a synonym for transportation, but the term transportation can only be used in connection with the transfer of goods if it is done using one's own vehicle and not for a fee. (Horváth – Karmazin, 2014). The transport of goods creates the connection between geographically separated sites located in different areas in the logistics system. This also affects the company's internal processes, customer service and relations with suppliers. We are talking about a complex area that significantly influences the level of service available, and this group represents a significant item within the costs.

The delivery of goods can also be carried out with one's own equipment, but it is common to use external service companies that specialize specifically in transportation. The carrier market is generally characterized by strong competition, as third-party service providers are present in large numbers on the market. On the other hand, in the case of transport, the transport company delivers the entrusted goods to the recipient against the fee imposed in the transport contract (Némon – Vörösmarty, 2009). The relationship between the carrier and the carrier is usually established by the freight forwarder. The shipping organization or person usually has

other goods transported by another means of transport for a fee. In some cases, the freight forwarder himself has a fleet of vehicles (usually vehicles suitable for road transport), with which he carries out the transport activity in whole or in part (Szegedi –Prezenszki, 2017).

2. Description of possible shipping methods

The choice of transport method can greatly affect the delivery time and cost. This is also why it is important to carefully choose the mode of transport, as the specific modes of transport have specific characteristics, which basically determine the advantages and disadvantages of the transport in a given time and situation (Némon – Vörösmarty, 2009; Szegedi – Prezenszki, 2017).

We distinguish between the following delivery methods:

- rail transport: Suitable for the transport of bulky goods at a relatively favorable price, typically with a long delivery time. They are usually used by businesses in the long term. Door-to-door delivery is not typical for this mode of delivery, as its use would require a built-in infrastructure.
- road transport: It is a significantly more flexible mode of transport than rail transport, and it also delivers short- and medium-distance deliveries in a short turnaround time, which can be greatly influenced by weather and traffic conditions. Higher shipping costs are to be expected here.
- water transport: a large mass of goods can be transported with this, and a long transit time is required. It is important that it is an environmentally friendly and cheap method of transport. The need for infrastructure is significant, in addition to the fact that exposure to weather conditions is also very high.
- air transport: It is not suitable for receiving a large amount of goods, it typically provides fast and accurate transport of goods over medium and long distances, but it is more expensive compared to other modes of transport.
- pipeline transport: It is equally suitable for short- and long-distance goods transport. They are rarely used for intra-company transport (e.g. fly ash and slag in power plants, and sand in mines). It mainly transports natural gas and mineral oil over long distances. Although the demand for infrastructure is significant, it does not depend on environmental effects, its environmental pollution is minimal and it involves a small specific operating cost.

In our article, we examined the road network in Romania necessary for the transport of goods by road, so we present information belonging to this group in the following. The reason for this is that road transport is also the most common mode of transport in Romania (road freight transport offers the possibility of fast and flexible door-to-door delivery of goods of different weights and sizes) and it is advisable to study this group in more detail.

Road transport is the fastest of all land transport methods, and door-to-door delivery has the biggest advantage. Trucks can usually approach the sites directly, so there is no need for transshipment (Attwood–Attwood, 1992). This mode of transport can be flexibly adapted to the needs of the carriers, while the delivery time is relatively short. The transport vehicles are able to transport almost all types of products, which is due to the wide range of vehicles. Based on a 2010 study, Egri highlighted even the lowest shipping cost feature (Egri, 2010).

It is an advantage that the loading time can be calculated, which is important in the case of JIT (Just in Time) systems in situations where consumers control the loading time, for example during construction work it is very important that the raw material to be used arrives on time (Benson et al., 1994)

In addition to countless advantages, road freight transport also has disadvantages. One of the biggest disadvantages is that it is highly dependent on environmental influences (such as traffic jams, weather, etc.). Compared to rail transport, road transport has a higher specific energy and labor demand, and in addition, the polluting and environmentally damaging effect is also significant or significantly greater than that of surface transport. Disadvantages include weekend delivery bans and route restrictions, which make it difficult to transport and thus make it difficult for goods to reach their destination (Egri, 2010).

Presentation of Romania

Romania is located in Central and Eastern Europe. In the middle of the country, you can see the mountain ranges of the Carpathians, which stretch 2/3 of their entire length in the territory of the country. In addition, other defining geographical and economic elements of Romania are the Danube and the Black Sea. Two-thirds of the length of the Danube flows through the territory of the country. It also has 190 km of coastline on the Black Sea. From an economic point of view, these geographical features significantly advance Romania. It is bordered by five neighboring countries and the Black Sea. Hungary and Serbia to the west, Ukraine to the north, Bulgaria to the south, and Moldova and the Black Sea to the east. With an area of 238,391 square kilometers and a population of more than 19 million people, it is the eighth largest and seventh most populous country in the European Union. Romania has been a NATO member since 2004, and since 2007 Romania has been a member of the European Union. Romania is made up of 41 counties and Bucharest, the capital of Romania (it has more than 1.9 million inhabitants). The country is divided into 4 economic macro-regions and 8 regions.

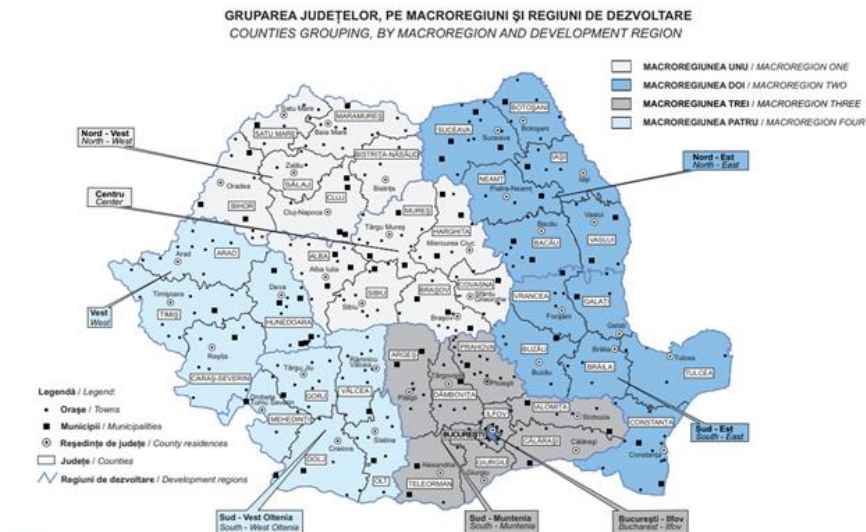


Figure 1: Administrative areas of Romania
Source: Romanian Statistical Office

A region consists of 4-6 counties (Figure 1) and 2 regions make up a macroregion. The "1. Macroregion" consists of two regions: the North-West and the Central region. The North-West region consists of 6 counties: Bihor, Bistrița-Năsăud, Cluj, Maramureș, Satu Mare, Sălaj. The counties of the Central Region are: Alba, Brașov, Covasna, Harghita, Mureș, Sibiu. THE 2. Macroregion" consists of North-East and South-East regions. The counties of the North-East region are: Bacău, Botoșani, Iași, Neamț, Suceava, Vaslui. THE 3. Macroregion" consists of South Muntenia and Bucharest-Ilfov regions. Argeș, Călărași, Dâmbovița, Giurgiu, Ialomița, Prahova, Teleorman counties belong to South Muntenia, while only Ilfov county and the capital belong to the Bucharest-Ilfov region. The 4th Macroregion also consists of 2 regions, South-West Oltenia and the Western region. Counties belonging to South-West Oltenia: Dolj, Gorj, Mehedinți, Olt, Vâlcea. The counties of the Western region are the following: Arad, Caraș-Severin, Hunedoara, Timiș. (Romanian Statistical Office, 2023).

Road transport accounts for the largest part of passenger and freight traffic in Romania. Romania's road network consists of international roads, national roads and county-maintained roads. The maintenance of national roads is the responsibility of the "Direcția Regională de Drumuri și Poduri". Roads in Romania are named with a combination of letters and numbers, sometimes letters are added to the numbers to distinguish road sections. The highest roads are marked with the letter "A" (as in *autostradă*), which indicates highways. For example, there is a 558 km long road section on the A1 highway: Bucharest-Pitești- Szeban-Déva-Temesvár-Arad-Nagylak-Hungary (M43). Unfortunately, the works are only partially finished. The approx. 100 km section between Déva and Lugoj has not yet been completed, because there is a road section of approx. 13 km long, and a 2.13 km tunnel built on this section is missing. The works are expected to start at the end of this year, so handover is still expected later. A later handover is also expected for the A3 highway Bucharest - Ploiești - Brasov - Sighsvár - Marosvásárhely - Cluj - Zilah - Nagyvárád - Bors - Hungary (M4), as only a fraction of the 603 kilometers, 167 km, has been completed.

Second highest road DEx as Drumuri Express, which indicates expressways. This is followed by Drumuri Naționale called DN, which can be translated as national roads, their numbers range from DN1 to DN79 and are maintained by the "Regional Directorate of Roads and Bridges". Roads marked E belong to the European road numbering system. The E60 road, for example, goes through France, Switzerland, Austria, Hungary and all of Romania to end at Constanța, the largest Romanian port city on the Black Sea. DJ (Drumuri județene) is the sign of county-maintained roads, which are under maintenance or construction by the counties and their municipalities.

Roads marked DC (Drumuri Comunale) are mostly unpaved roads and roads that are interesting from a tourist point of view. All roads in Romania are subject to payment, whether they are marked A or even DC, as we enter the territory of Romania, the "Rovinieta" is mandatory for all types of vehicles, which can be used throughout the country, on any marked road, even on the highway. The toll can be

redeemed until midnight on the day of entry at any gas station, border crossing point, via SMS or online (Transtalex, 2022; Romania, 2023).

The European Union road situation

The length of the motorway in Romania is 931 km, which is roughly half of the road network in neighboring Hungary (Figure 2).

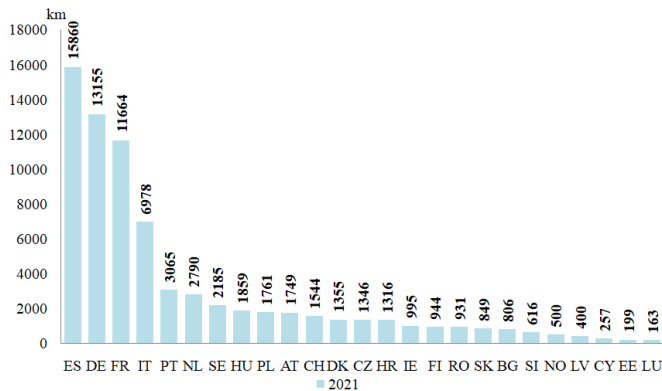


Figure 2: The length of motorways in the European Union member states in 2021
Source: Own calculation based on Eurostat 2023a

The average length of motorways in the European Union is 2,931 kilometers, to which the motorways of Spain, Germany and France contribute greatly. Examining each of the EU member states, it can be established that half of the EU member states are located below 1,346 km, and 50% above. Unfortunately, Romania does not reach this value, so it can be concluded that Romania's highway infrastructure requires improvements in the future. In the ranking, Romania was ahead of Slovakia, Bulgaria, Slovenia, Norway, Latvia, Cyprus, Estonia and Luxembourg (Luxembourg 163 km).

In order to see the European road network, it was necessary to examine the total road length of each member state in 2021 (Figure 3).

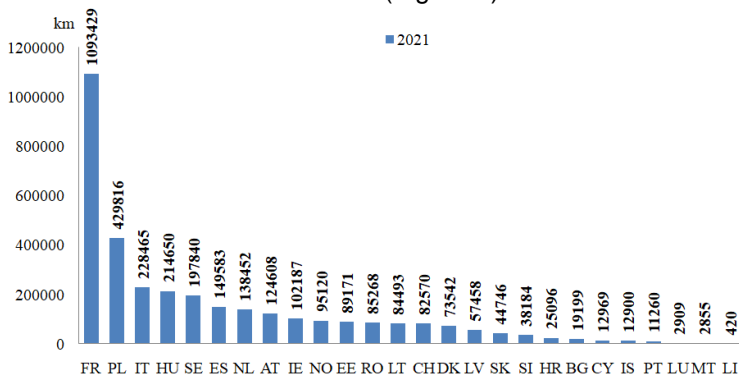


Figure 3: The length of the road network of the European Union member states in 2021

Source: Own editing based on Eurostat 2023b

France has the largest road network in the EU (Figure 3), followed by Poland. Hungary was also in 4th place in this survey, while Romania was in 12th place. The total road network in Romania is approximately 85,000 km, which is due to its geographical features of high mountains and untouched natural areas and forests. If we examine the proportion of highways, it can be concluded that Portugal has the highest proportion of highways (approximately 30%) of the total road length. Portugal is followed by Spain, with almost third volume (10.6%). It was interesting to see from the survey that Estonia was in last place with 0.2%. Hungary is in 5th place from the back, and Romania is ahead of Hungary in this case, since the highway accounts for 1.1% of the total road length in Romania (only 0.9% in Hungary). The European Union average is 3.4%, and the median value based on the calculations is 1.7%. These calculated values will be available in the near future with future developments and support.

The following comparison concerned the development of freight charges for the member states of the European Union in 2019 and 2020 (Figure 4). The general freight charges are given by the individual member countries in their own currency, but it is increasingly common in Europe to make calculations in Euros. It's easier for businesses to sell their services in euros, because if they do international shipping, they don't have to deal with daily exchange rate fluctuations. In our calculation, the 2020 average of the 27 countries of the European Union gives 100% and we compare the countries individually to this base year.

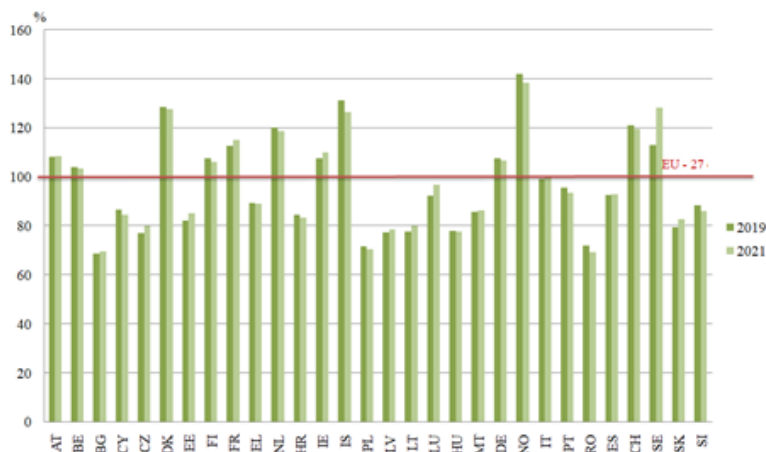


Figure 4: Development of freight charges compared to the EU 27 average

Source: Own editing based on Eurostat 2023c

They work in Norway with the highest freight charges, since the amount of freight charges there was 138.5% of the EU average in 2021. The lowest freight rates were in Bulgaria, as freight rates in 2019 were 68.5% of the European Union average (but by 2021, Bulgarian companies have raised freight rates to 69.4%). In relation to

Romania, businesses reduced their prices, so the country fell below Bulgarian prices.

In 2021, freight charges in Romania will reach only 69.1% of the EU average. Thanks to this, in 2021, Romania is the cheapest among the member states of the European Union in terms of freight charges. Hungary is not the most favorable country in terms of freight charges, but after Romania, Bulgaria and Poland, the prices in our country are the lowest, reaching 77.6% of the average freight charges in the European Union. In 2021, similar to Romania, businesses in Hungary also minimally reduced freight and forwarding fees compared to the prices of 2019.

In order to get an adequate picture of the situation in the European Union, it is necessary to examine the age composition of the fleet of trucks performing the services. It can be seen that nearly half of the truck stock in the European Union is older than 5 years, and nearly 40% is older than 10 years (Eurostat 2023d). In France, Germany, the Netherlands, Austria and Sweden, the proportions are about the same between the four age groups, while in Belgium, Lithuania and Slovenia the proportion of old cars is very low, with the first three age groups mostly dominating. On the other hand, in Cyprus and Romania, 70% of the population is made up of old 10-20-year-old cars. Even though Hungary can't boast either, as 48% of its truck stock is made up of 10-20 year old vehicles, it still has a newer vehicle fleet than neighboring Romania.

So, based on the calculations, it turned out that Romania's truck stock is the second oldest in the EU after Cyprus. On the other hand, Hungary has a relatively younger equipment park, similarly to Spain, Portugal, Finland, Poland, Latvia and Malta.

The analysis of public roads and motorways in Romania

Romania is a big competitor for Hungary in terms of shipping and transportation. In many cases, Hungarian companies entrust a Romanian contractor with carrying out the transport/shipping activity instead of Hungarian contractors.

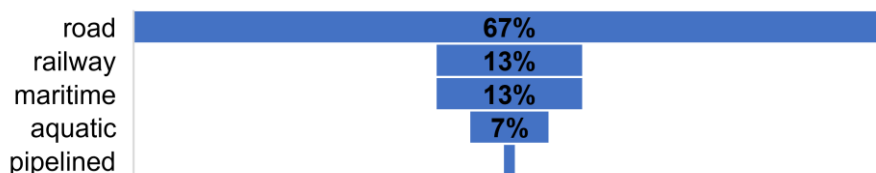


Figure 5: Distribution of freight transport by mode of goods transport in 2021

Source: Own calculation based on Inssie (2023a) data

In 2021, most goods were transported by road in Romania as well (Figure 5). 67% of the moved goods were transported by road. The second most popular mode of transport was rail transport, which accounts for 13%. Proximity to the coast did not

matter much for shipping, as only 1% of all shipments occurred (roughly the same amount as pipeline shipping). Air transport has no relevance in Romania.

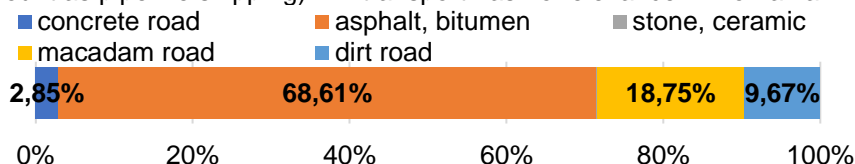


Figure 6: Distribution of the road network in 2021 by type of road surface

Source: Own edit based on Inssie (2023b) data

Romania's total road network in 2021 was 86,199 kilometers, the largest percentage of which is asphalt or bitumen (about 68.61% of the entire Romanian road network is asphalt and bitumen). The second largest proportion is macadam road, which accounts for 19% of the total road surface (in Hungary, only 9.67% is undeveloped road or dirt road). To a small extent, concrete roads, stone and ceramic pavements still appear on the roads in Romania (2.85%), which is only 0.1% of the road length in Romania (Figure 6).

It can therefore be concluded that Romania's road network is developed, the road network consists of the largest percentage of completed asphalt roads, which have been continuously built in recent years (the number of asphalt roads increased by 4% compared to the base year 2017), dirt roads, macadam roads, and concrete roads were gradually replaced by this modern type of road surface.

The next investigation concerned the length of the highways. It can be concluded that the construction of highways and motorways has shown an increasing trend in recent years, but this amount is still far below the EU average. The length of expressways accounts for only 1.08% of the entire road network. Compared to the base year of 2016, an increase of almost 25% can be observed, which represented an average annual increase of 4.5%.

If we examine the distribution of expressways by macro-region in the year 2021, it can be concluded that the 3rd Macro-region has the most motorways (Insse, 2023). The members of this region are the capital and Ilfov county, as well as Arges, Călărași, Dâmbovița, Giurgiu, Ialomița, Prahova and Teleorman, thus the catchment area of the capital. The next in line is the 4th Macroregion, which includes the West and South-West Oltenia regions, including the counties of Arad and Temes and Hunyad, among others. However, there is a huge gap between the capital region and the Western region, since not a single kilometer of highway was built in the South-West Oltenia region in 2021. By focusing on this area, it would be possible to reach the Black Sea by highway. The fewest motorways can be observed in the 2nd Macroregion in the Eastern and North-Eastern regions of the country, which is actually the territory of the old Romania. Only 10% of the total length of the highway can be found in this section. In these regions, a total of 94 kilometers of expressways can be observed only in Bacău and Constanța counties, of which 74 kilometers, being a port city, are in Constanța county.

Figure 7 illustrates the length of highways up to 100 km. Although the București-Ilfov region clearly stands out from the rest, it should be noted that 22 kilometers of highways fall on the capital's 240 km² area, so there are 9.1 km of highways per 100 km² area in the capital, which raises the regional average by 4.6 km/100 km². It is

clear that the length of highways and motorways in the other regions is insignificant compared to the regional conditions. With the exception of the capital region, none of the regions reaches one kilometer, what's more, the data of the South-West Oltenia region is exactly equal to zero, because in this region not a single kilometer of highway has been built, creating a big gap between the capital and western regions. The north-eastern region also only has a 20 km highway section, which is located in Bacău county, so the expressway network per 100 km² of this region can be reduced to almost zero, this value is exactly 0.05 km/100 km².

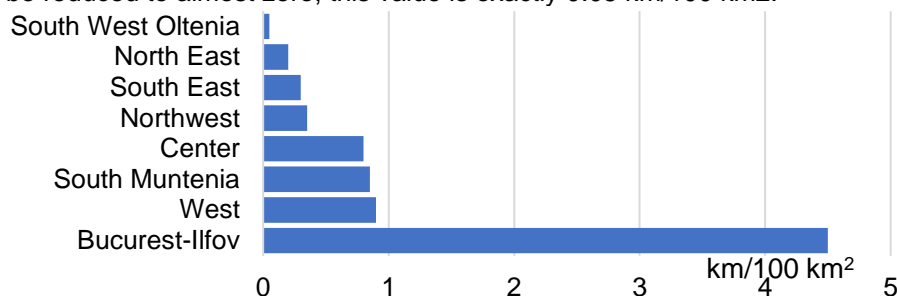


Figure 7: length of motorways per 100 km² by region in 2021

Source: Own calculation based on Inssie (2023c) data

The last part of the research was the examination of the truck stock in Romania. The research revealed that Romania has an aging fleet of vehicles. Unfortunately, the proportion of modern, young 2-5 year old trucks is negligible (5% of the examined population). Cars aged 2-5 years make up 10%, while cars 5-10 years old make up 17% of the total fleet in Romania. The largest proportion are 10-20-year-old vehicles, the number of which is approximately 564,000 (68% of the population).

5. In conclusion

Based on the prepared calculations, it can be concluded that compared to Hungary, Romania has shown a greater development trend based on the development of public roads in the last 5 years. Romania had a total of approximately 87,000 kilometers of road network based on 2021 data. Comparing the road networks of Hungary and Romania, it can be concluded that the road density is much higher in Hungary than in Romania. The length of the road network per person prepared by us is also below the European Union average in Romania.

In Romania, the amount of nationally maintained road networks and the amount of asphalt roads are below the EU average. The reason for this is, on the one hand, the national legislation, because while in Hungary a settlement can only be classified as a city if all its main roads are paved, this is not the case in Romania. In Romania, even in the 1990s, the city classification could be obtained where the population exceeds 10,000 people (regardless of the road network of the area).

In our research, we also examined the number of highways in Romania, where we came to the conclusion that the length of highways in Romania does not even reach

1%. Even though the development trend of Romania's road network was better, the length of the highways still does not reach even half of the length of the Hungarian expressway network.

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THE EVOLUTION OF RAILWAY TRANSPORT INFRASTRUCTURE IN ROMANIA AFTER 1990

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Abstract: *The purpose of this paper is to analyse the physical, economical, and strategic evolution of the Romanian railway infrastructure based on data extracted from EUROSTAT. The timeframe chosen for this study is between years 1990 and 2019, from the fall of the communist regime, through 2007 when Romania became a member of the European Union, until the beginning of the Covid - 19 pandemic. The Romanian railway infrastructure is analysed and compared with those from other European countries. One of the first observations is that the Romanian railway has one of the largest networks in Europe, being placed 2nd in terms of length in year 1990, after Poland. Unfortunately, in contrast to having one of the largest networks, economically it situated at the end of the hierarchy, being one of the most inefficient. Having constant decreasing amounts of transported goods over time, the sector doesn't have enough cash flow to secure the necessary funds for maintenance and mandatory technological upgrades. The sector is badly managed and cannot sustain itself anymore. The high number of victims each year makes it one of Europe's most unsafe railway networks and this hinders the level of trust and willingness for collaboration from private entrepreneurs. The private sector should be encouraged to increase the volume of goods transported as well as participate in investments. The Government could even consider a Public Private Partnership strategy to attract a cash infusion into the sector. There is great potential for a positive impact on the country's economy if the Authorities would implement a strategic investment and development master plan to bring the railway infrastructure to a level of reliability that would attract businesses and stimulate the movement of goods. The geographical location of Romania could accelerate such development since it could be an important logistics hub linking the Black Sea to the Central European market. Empirical results show that the length of railway network is negatively correlated with income and negatively associated with the volume of transported goods in Romania over the period of 2004-2019. It is apparent that for this sector the size of the current network should be sufficient, but quality should be improved, since this is the element that enhances operation safety and operation characteristics such as speed and volumes of goods transported. The paper includes recommendations for public policies regarding the transport infrastructure sector.*

Keywords: Romania; transport infrastructure; economic development; railway network; transport policies.

JEL classification: F63; F68; L92

1. Introduction

The economy of Romania has certain pillars with a central significance. One of these pillars is transport infrastructure. Through the years, the focus was on sustainable development of the road network through more efficient roads, such as the construction of highways. However, the railway infrastructure could, and still can, play a key role in the development of the national economy.

We analysed data about the railway network to show the development and investment trends in transportation infrastructure of a country emerging from the communist regime and going through the transition of becoming a democratic Member State of the European Union (EU). This transition opened the market and facilitated investment and trade, but it also gave access to massive financial support through the European Cohesion Funds. It has been previously showed by other Romanian researchers that the absorption of such funds has been very low and that there is a big difference between what the Romanian Authorities have planned before the year 2007 and what they have done after said year (Popescu & Fistung, 2014).

The aim of this paper is to analyse the evolution of the railway transport infrastructure in Romania in the past 33 years, based on statistical data from EUROSTAT, and to make some policy recommendations. The paper intends also to show the correlation between the railway transport infrastructure and the movement of goods and economic development of Romania.

After revealing the importance of transport infrastructure in the economy, based on existing literature, the third section shows the evolution of the railway network over time, and the current percentage of electrified tracks. This is to show evolution in time but also the efficiency, as well as the level of concern for environmental protection in past policies. We also present the traffic management system and the safety levels of the network, with a brief comparison with other European countries. The evolution of the human resource strategy is also discussed during the transition from the communist to the capitalist approach.

The fourth section presents the research methodology, being followed by empirical results. In the final part we showed our conclusions regarding our findings and made some policy recommendations.

2. The Importance of Transport Infrastructure for the Economy

We chose to analyse the transport infrastructure data because it acts as the backbone of economic activities, and it can facilitate the movement of goods and labour force supporting economic growth and development. It encourages private investments and stimulates business to engage in trade by enhancing the mobility of people allowing them access to higher education, better health services and access to jobs that are further away from their home. Previous research such as the work of Herranz-Loncan (2007) has revealed a positive correlation between infrastructure investments and economic growth.

The importance of transport investments and policy in the economy has been extensively debated and studied (Aschauer, 1989; Easterly & Rebelo, 1993). Investments in infrastructure development have been a focus throughout history

allowing us to observe cases such as that of the Swedish infrastructure development. In the first phase of their industrialisation period in the 1850s they focused on infrastructure construction. Only after the Second World War did they focus more on education to infuse the industry with well trained and specialised labour force. Policy making is a complex process and it must not be left only in the hands of politicians, but it should be a common effort of decision makers and specialists who analyse several competing models or scenarios (Eliasson et al., 1993).

A well-managed transport infrastructure can attract foreign investment and the case of Romania could be a good example of such approach since it emerges from a closed economy and it opened to the international market. Foreign direct investment has been shown to positively influence the logistics infrastructure and lead to economic growth in the recipient country. Even so, it comes to the responsibility of the recipient country to create the proper environment to attract such foreign investment by adjusting their policies and regulations (Saidi et al., 2020).

Optimisation of the environment is the key to make things work; some approaches can be optimistic in theory but might be hindered in practice by factors such as corruption. Thus, a country can dispose of optimal transport policies and development strategies but an unstable political administration with a general affliction towards bribery can distort the results of a 'master plan'(Cieslik & Goczek, 2017).

It is largely debated if investments in transport infrastructure lead to economic growth or if it creates economic competitiveness, but it is likely to happen under certain conditions, depending on the investment and development strategies, on transport and economic policies and on the political and institutional climate (Meersman and Nazemzadeh, 2015).

Transport infrastructure investments can also produce wider economic impacts that should be taken into consideration by the decision makers when choosing certain investment approaches or elaborating transport policies. Transport infrastructure usually implies large projects that tend to have large impacts on the economy both locally or at a regional level and in the case of railways the ripples of its effect could be felt on a national or international level (Rothengatter, 2017).

3. Evolution of the Romanian Railway Industry

3.1. Railway Network, Safety, and Transport Management Systems

In this paper, we chose to focus on the evolution of different sectors regarding the railway infrastructure from 1990 to 2019 and in some cases, we focused on the year 2007 for reasons that we shall further explain. Data regarding Romanian transport infrastructure has openly become available and started to be recorded on EUROSTAT only after the fall of the communist era. It was in 2007 when Romania became member of the EU, and 2019 is the last year with available data. Thus, our timeframe for this paper has been defined with focus on the years that we believe represent certain turning points in the development of Romania.

The first data analysed is the length of the railway network with focus on those countries that had recorded values for the timeframe selected. Due to the lack of data for certain countries we made two graphical representations: Figure 1 to show the evolution of total length of track from 1990 to 2007 and Figure 2 to show available data from 2007 to 2019. In 1990 Romania had a total of 22.179 km of railway tracks

and in the following 17 years until it became a EU Member State, the length of the railway network reduced by 1.511km. After year 2007, it further reduced by another 589 km even though this is a period when Romania started having access to the Cohesion Funds, including support specially designated for large infrastructure. We shall later show why this reduction in length is not as big of an issue as we might think, while showing the actual strategic mistakes that were made in these years. Romania has one of the largest railway infrastructures in Europe but also has one of the largest decreases in total length of railway network (EUROSTAT, 2021a).

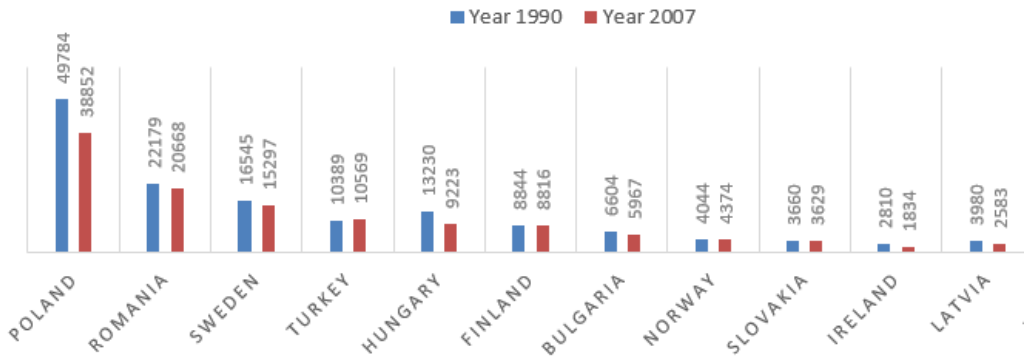


Figure 1: Evolution of length of tracks (km) in some European countries from 1990 to 2007

Source: Authors' own computation based on EUROSTAT data (RAIL_IF_TRACKS)

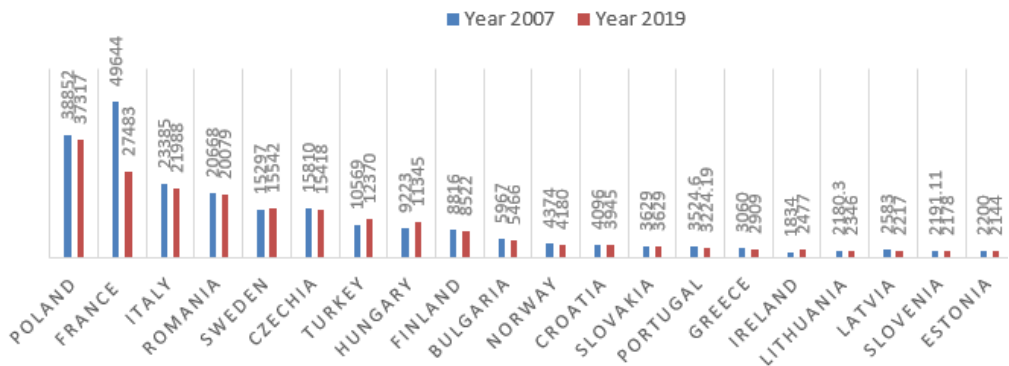


Figure 2: Evolution of length of tracks (km) in some European countries from 2007 to 2019

Source: Authors' own computation based on EUROSTAT data (RAIL_IF_TRACKS)

We must ignore the spike in France's total network length in the year 2007, observable in Figure 2, since it is explained in the metadata that a different type of measurement was used to obtain that value. In 1990, Romania was positioned 2nd in Europe, in terms of total length of railway network. In 2007 as more data have been recorded, the statistics expanded to 25 European countries, Romania being

the 5th. It was overtaken by Italy, France and Germany who are historically powerful economies and have extensive transport infrastructure, not to mention that all these countries, especially France, expand on much larger geographical areas. We can assume that extensive infrastructure building has been done during the communist era after that it was not a necessity to expand the network further. Meanwhile, we must argue that it would have been indeed a necessity for the State to invest in maintenance, refurbishments, modernisation and innovation (EUROSTAT, 2021a).

In Table 1 we observe the evolution of electrified railway lines in European countries. We computed the percentages of increase to compare the electrification process in different countries. On most of the 20.079 km of Romanian railway, unfortunately operators still use diesel powered locomotives, in an era in which one of the most emphasised phenomena is environmental protection (EUROSTAT, 2021b).

The total length of Romanian electrified railway tracks in the year 2019 is 4.029 km, representing 20.06% of the total network. We compare this value with the one from 1990, which is 3.680km to conclude that 349 km of railway tracks were electrified in a 29-year time frame. This represents an increase of only 9.48% in three decades. If we rank the countries percentage-wise then Romania is positioned 18th and if we rank them in terms of kilometres electrified then Romania is ranked 13th, either way it is ranked towards the end of the list which is a sign that investments in modernisation of the railway system have not been at its peak (EUROSTAT, 2021 b) (RAIL_IF_ELECTRI, 30/04/2021).

Table 1: Length of electrified tracks in 1990 and 2019 in some European countries

Country	Length of electrified tracks in 1990 (km)	Length of electrified tracks in 2007 (km)	Length of electrified tracks in 2019 (km)	Increase in electrified tracks (%)
France	12.512	15.123	16.067	28.41%
Italy	-	11.531	12.016	4.2%(d)
Poland	11.387	11.898	11.202	-1.62%
Spain	6.416	8.095	9.984	55.61%
Sweden	7.382	7.848	8.185	10.87%
Hungary	2.249	2.738	5.560	147.22%
Turkey	603	1.920	5.070	740.79%
Romania	3.680	3.959	4.029	9.48%
Austria	3.246	3.847	3.976	22.48%
Finland	1.663	3.047	3.331	100.3%
Czech R.	2.579	3.060	3.231	25.28%
Bulgaria	2.640	2.806	2.869	8.67%
Norway	2.426	2.552	2.483	2.34%
Portugal	458	1.435,6	1.695,65	270.22%
Slovakia	1.330	1.578	1.587	19.32%
Croatia	844	980	970	14.92%
Greece	-	199	731	72.77%(d)
Denmark	230	640	730	217.39%
Slovenia	499	502,75	610	22.24%

Luxembourg	197	262	262	32.99%
Latvia	271	257	250,9	-7.41%
Macedonia	233	234	234	0.42%
Ireland	37	108	158	327.02%
Lithuania	122	122	152	24.59%
Estonia	132	132	138	4.54%

Note: Percentages are calculated for the difference from 1990 and 2019

Source: Authors' own computation based on EUROSTA data (RAIL_IF_ELECTRI)

Safety is at the core focus of railway transportation since previous accidents have shown trains can produce catastrophes with massive human casualties and environmental damage, thus we shall extend our analysis to the data referring to traffic management systems and to victims in railway-related accidents.

In 2019, in terms of Track-Based railway traffic management, Romania is ranked 9th out of the 12 European countries with recorded data in this sector, being surpassed by countries with smaller railway networks like Bulgaria, Belgium and Slovenia, as shown in Figure 3 (EUROSTAT 2021c).

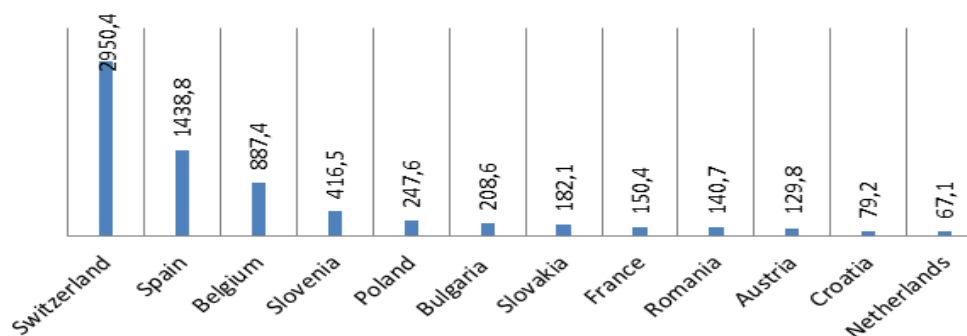


Figure 3: Length of tracks with track-based traffic management system (km) in 2020

Source: Author's own computation based on EUROSTAT data (RAIL_IF_TRAFF)

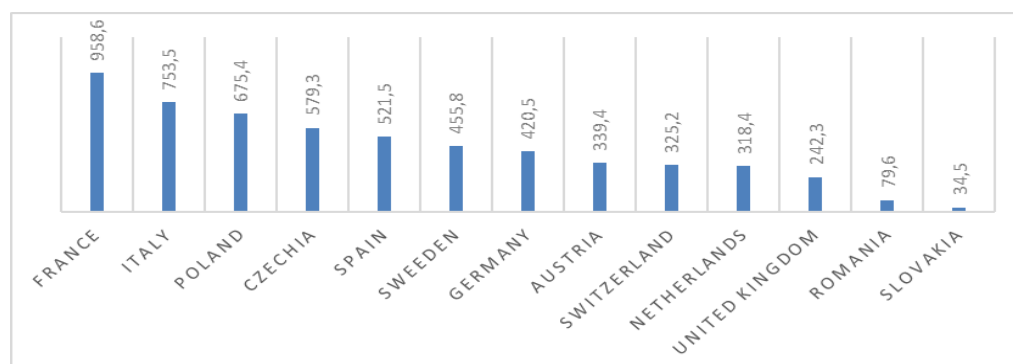


Figure 4: Length of tracks with radio-signal traffic management system (km) in 2020

Source: Authors' own computation based on EUROSTAT data (RAIL_IF_TRAFF)

From the perspective of Radio-Signal traffic management, Romania is second to last being furthermore surpassed by Netherlands, Austria, and other countries as seen in Figure 4, thus, placing Romania at the end of the European rankings in terms of traffic management systems. The reporting accuracy must be taken into consideration and the fact that other safety systems might be in place, systems that are not monitored on the European Statistics Platform. Even so, considering what we have learned based on available data and observing the lack of such technology in operation in Romania, we look at the number of victims in railway-related accidents (EUROSTAT, 2021 c).

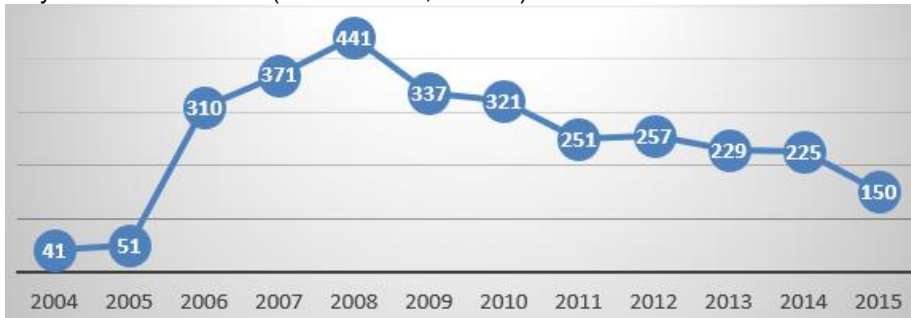


Figure 5: Number of victims in railway related accidents in Romania 2004-2015
Source: Author's own computation based on EUROSTAT data
(RAIL_AC_CATVICT)



Figure 6: Distribution of victims in railway related accidents in Romania 2004-2015
Source: Authors' own computation based on EUROSTAT data

This data has been recorded from 2004 to 2015 and throughout these years Romania ranked amongst the first places in terms of number of victims. In 2007, when Romania became a EU Member State, prior to any external financial aid, it was ranked 3rd with a total of 371 victims. In 2015, 8 years after being granted access to various cohesion funds, thus having already the possibility of making certain investments to improve the safety systems, Romania is still ranked 3rd. The number of victims has reduced but almost half of the victims suffer fatal injuries, as portrayed in Figure 6. This shows that the Romanian Railways are amongst the most dangerous in the European Union (EUROSTAT, 2021d).

3.2 The Employment, Investments, and Transported Goods

It is popularly known in Romania that during the communist administration many people were employed by the Romanian National Railways, but it is impressive to see the data in Figure 7.

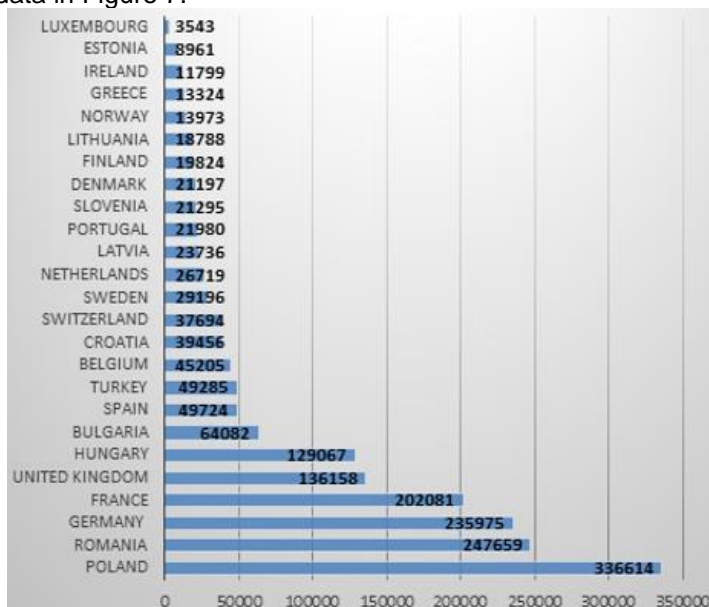


Figure 7: Number of employees in Railway Companies in European countries in 1990

Source: Author's own computation based on EUROSTAT data (RAIL_EC_EMPLO_A)

In 1990, 247.659 people were working for this company. This number represents 1.06% of Romania's total population in that year. This number placed Romania 2nd in the European rankings, having more railway workers than Germany, France, or the United Kingdom, having 5 times more workers than Spain, Turkey, Belgium or Croatia and even more than the last 13 countries combined (EUROSTAT, 2021e).

Figure 8 shows the employment in railway enterprises in Europe in 2008. In Romania there are 41.520 employees, a reduction of more than 200.000 jobs over 18 years. This massive reduction shows a more economic approach to the management rather than the social one before 1990.

The lack of expansion of the railway infrastructure makes us shift our focus to the available data on maintenance expenditure and investments. We can already conclude, based on previously analysed data that if investments did exist, these were not focused on electrifying tracks or on implementing new safety management systems.

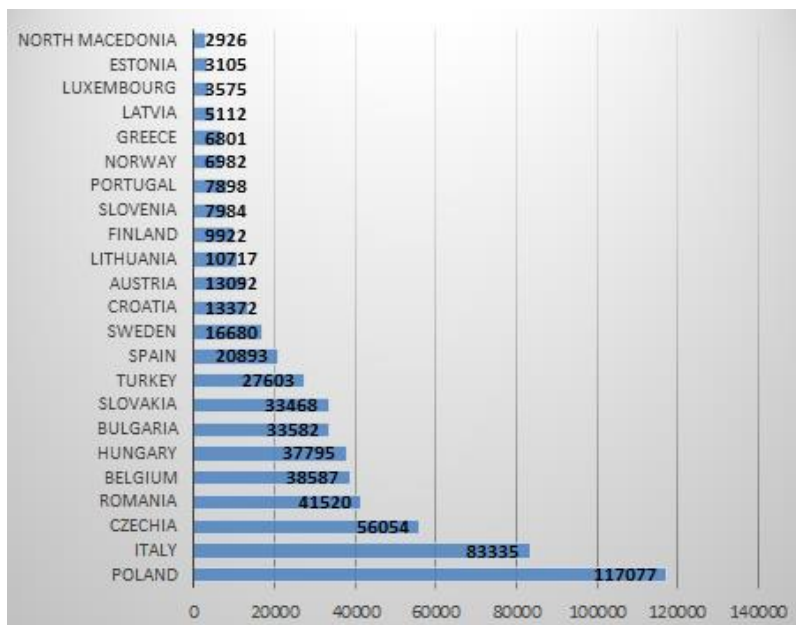


Figure 8: Number of employees in Railway Companies in European countries in 2008

Source: Authors' own computation based on EUROSTAT data (RAIL_EC_EMPLO_A)

Data regarding expenditures on maintenance is not available so we cannot do an analysis on this topic. The limited data and all values recorded add up to 13.8 million Euro with its peak in the 2004 with a value of 6 million Euro spent on railway infrastructure maintenance. The situation is similar with investments, all values recorded add up to 2 million Euro and they cover only 10 years. The lack of data leaves room for further additions to the research (EUROSTAT 2021f).

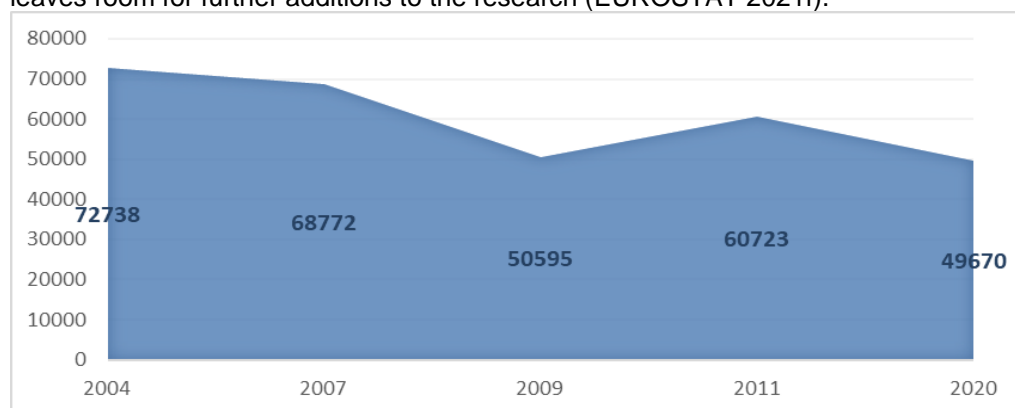


Figure 9: Goods transported by railway in Romania (thousand tons) from 2004 to 2020

Source: Authors' own computation based on EUROSTAT data (RAIL_GO_TOTAL)

One of the most important data to analyse is the transportation of goods. Data is available beginning with year 2004, so it does not cover the whole timeframe we established for this paper, but it is enough to observe the tendencies. In the year 2004 a total of 72.7 million tons of goods were transported by railway, this amount decreased through 2007, to 68.7 million tons but, the numbers were expected to rise in the years to come due to becoming a Member State of the EU. In reality, the volumes of transported of goods has stabilised at around 55 million tons per year for the decade to come only to reach its lowest point ever recorded in 2020, namely 49 million tons. Overall, we see a decrease in the transport of goods on the Romanian railway of more than 31% in the past 14 years (EUROSTAT 2021g).

4. Research methodology

One aim of this paper is to analyse the correlation between Romanian railway transport infrastructure and the movement of goods to determine if it influences the country's economic growth and the economic competitiveness. For this purpose, the following research hypothesis was formulated:

"The length of the railway has a positive and significant influence on the movement of goods in Romania".

The second research hypothesis is

"The length of the railway has a positive and significant influence over Romania's GDP".

Following these research hypotheses, the dependent variable is represented by the amount of goods transported using railways, respectively the GDP and the explanatory variable is considered the number of kilometres of railways. The data used was retrieved from the Eurostat database for the period 2004 – 2019.

We use the following regression model:

$$Y_t = \alpha + \beta \cdot X_t + \varepsilon_t \quad (1)$$

where: Y_t is the dependent variable, t -denotes time, X_t is the explanatory variable, α is a constant, β is the regression parameter, and ε_t is the error.

We will estimate two equations, one for each of the two dependent variables (GOODS and GDP):

$$GOODS_t = A_1 + A_2 \cdot LENGTH_t + \varepsilon_t$$

(2a)

$$GDP_t = B_1 + B_2 \cdot LENGTH_t + \varepsilon_t \quad (2b)$$

where: GOODS represent the goods transported using railways, GDP expresses the gross domestic product and LENGTH represent the kilometres of railways.

Data processing was made through E-Views software, using the Least Square method of estimation.

5. Empirical Results

The descriptive statistics of the variables shows by the Jarque-Bera test the abnormal distribution of them ($p > 5\%$), with a positive skewness (Skewness > 0),

but a platykurtic kurtosis of movements of goods and GDP (Kurtosis < 3), and a leptokurtic kurtosis of railway length (Kurtosis > 3) (Table 2).

Tabel 2. Descriptive statistics of variables

	GOODS	GDP	LENGTH
Mean	59065.31	141646.7	20434.56
Median	55919.00	138200.8	20262.50
Maximum	72738.00	223162.5	21360.00
Minimum	50348.00	60402.00	20077.00
Std. Dev.	7631.593	42707.27	400.9178
Skewness	0.501301	0.033518	1.170769
Kurtosis	1.770533	2.734147	3.337151
Jarque-Bera	1.677867	0.050114	3.730983
Probability	0.432171	0.975254	0.154820
Sum	945045.0	2266347.	326953.0
Sum Sq. Dev.	8.74E+08	2.74E+10	2411026.
Observations	16	16	16

Source: Authors own computation based on data published by Eurostat
(RAIL_GO_TOTAL, NAMA_10_GDP, RAIL_IF_TRACKS)

The results of the first regression equation reflect that there is a positive correlation between the length of the railway and the amount of goods transported ($A2 = 14.26868$). The length of the railway is a significant explanatory factor of the movement of goods in Romania, p-value being less than 1% (Table 3). According to this result, the research hypothesis was confirmed.

Table 3. Empirical results of first regression equation regarding the influence of the length of railway over the transportation of goods

Dependent Variable: GOODS; Included observations: 16

Method: Least Squares (Gauss-Newton / Marquardt steps)

	Coefficient	Std. Error	t-Statistic	Prob.
A(1)	-232508.9	68822.98	-3.378361	0.0045
A(2)	14.26868	3.367362	4.237346	0.0008
R-squared	0.561885	Mean dependent var		59065.31
Adjusted R-squared	0.530591	S.D. dependent var		7631.593
S.E. of regression	5228.664	Akaike info criterion		20.07817
Sum squared resid	3.83E+08	Schwarz criterion		20.17474
Log likelihood	-158.6253	HannanQuinn criter.		20.08311
F-statistic	17.95510	Durbin-Watson stat		1.539755
Prob(F-statistic)	0.000828			

Source: Authors own computation based on data from Eurostat
(RAIL_GO_TOTAL, RAIL_IF_TRACKS)

The results of the second regression equation show the negative correlation between the length of the railway and GDP ($B_2 = -87.91613$), the length of the railway being a significant explanatory factor of it ($p\text{-value} < 1\%$) (Table 4). This result reflects the direct influence of railway infrastructure on the economic development of Romania showing the unsustainability of the Romanian infrastructure and the lack of investments that inhibit economic growth. Based on the result obtained, the research hypothesis was invalidated.

Table 4. Empirical results of second regression equation regarding the influence of the length of railway over the GDP

Dependent Variable: GDP

Method: Least Squares (Gauss-Newton / Marquardt steps)

Included observations: 16

	Coefficient	Std. Error	t-Statistic	Prob.
B(1)	1938174.	328562.5	5.898952	0.0000
B(2)	-87.91613	16.07586	-5.468828	0.0001
R-squared	0.681152	Mean dependent var		141646.7
Adjusted R-squared	0.658377	S.D. dependent var		42707.27
S.E. of regression	24961.76	Akaike info criterion		23.20455
Sum squared resid	8.72E+09	Schwarz criterion		23.30112
Log likelihood	-183.6364	HannanQuinn criter.		23.20949
F-statistic	29.90808	Durbin-Watson stat		0.634661
Prob(F-statistic)	0.000083			

Source: authors' own computation based on data published by Eurostat
(NAMA_10_GDP, RAIL_IF_TRACKS)

6. Conclusions

Increase in mobility is the result of debatable investments since the decision of infrastructure development usually falls under the public administration responsibility and hence the allocation of public funds is always subject to argument. Therefore, there will always be a debate on expenditure of public funds and how they favour an economic or a social purpose (Fedderke et al., 2006).

Regarding the Romanian railway network, we already know that it had a large social impact, since it probably used to be Romania's largest employer during communism. This might be the reason behind its very large size. Also, an impressive volume of labour force was needed for its construction as it was needed for its maintenance in the years to come. Even so, the world changes, democracy has prevailed in Romania as in other developed regions across the world and the economic efficiency of such a large segment of the transport infrastructure is imperative.

Transport infrastructure can also stimulate economic development and implicitly the general wellbeing of the population. By opening to international trade and the international market, the local economy can benefit in ways such as stimulus for development in the local businesses, since in some industries transportation represents a large percentage of costs, the opportunity of benefiting from foreign direct investments and collaborations with neighbouring countries, thus not only stimulating economic relations but also people to people bonding (Wang, 2020).

The decreasing length of the railway infrastructure is not of primal concern since we understand its previous role, what concerns us is the small percentage of electrified tracks, the very short distances monitored by transport management systems, the high figures in terms of victims in accidents and the 31% fall in goods transported. The slower movement of goods can hinder the trade pattern between Romania and other countries and directly affect productivity which in turn reduces the various spill-over effects to other industries. The imports and exports growth rates are directly affected by the transport infrastructure performance thus a reduction in goods transported should not be accepted and suitable strategies must be put in place by those in charge to stop this trend as soon as possible (Yang et al., 2020). While most regional administrations are focused on reducing trade costs, the high numbers in victims of railway related accidents in Romania can suggest higher risk, thus higher costs and this directly affects international trade by forcing transporters into searching for other transport corridors.

The need for investments in the railway infrastructure is for reasons of safety and economic efficiency. Due to the lack of electrified lines, diesel locomotives still pollute some of the last virgin forests of Europe, but if this is not enough then the fact that diesel locomotives are very expensive for operators should convince the authorities to invest in this sector. Private development in terms of railway operators has been seen in the past years and this private involvement in the railway industry should be stimulated by facilitating an environment for it to flourish. As per data provided by the EUROSTAT platform, only 944 thousand tons of transit goods are transported yearly in Romania, Bulgaria just south of Romania with a railway network that is 27% of the length of the Romanian network transports 1451 thousand tons, 53.7% more than Romania.

A good management with a clear investment strategy and well-established development targets should generate an impressive return on investment for the Romanian Railways. Considering the optimal geographical positioning, the already extensive railway network, and the economic know-how as well as the financial support of the European Union, Romania should have its path paved with efficient and effective governmental initiatives.

Romania should act within the framework of the European transport policy and design its national policies in accordance with the European targets regarding the railway transport infrastructure. For example, Romania should implement safety standards that could mandate the infrastructure operator to invest in traffic management systems, in higher redundancy safety systems and technology that collects data to investigate the various causes of accidents. Train operators should go through a certification process in which they would have to adapt their systems to the one implemented by the infrastructure operator and mandate employees that are directly involved in the operation of vehicles to undergo safety training programs.

Regarding the environmental protection issue, an infrastructure master plan should be put in force for the electrification of railway tracks, with focus on main goods-transport routes and on those routes passing through areas in close vicinity to national parks or protected areas. Train operators should provide certification showing efforts made towards a more nature-friendly operation in accordance with the National Policies. European Cohesion Funds for large infrastructure should be a primal focus for the infrastructure operator, to invest in modernisation of lines and digitalisation to reduce the delay times as much as possible, hence encourage and facilitate optimal conditions for transport of goods.

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PUBLIC-PRIVATE PARTNERSHIP'S ASCENT AND FALL IN EUROPE

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Abstract: *Collaborations between public and private have appeared in Europe since ancient times, presenting in different ways from one nation to another, and being the source of the current "public-private partnership" arrangement. This study aims to emphasize the significance of "public-private partnership" for a certain area. In this research, I used the qualitative technique to examine and understand the global experience in developing public-private partnerships. The method was effective in showing how "public-private partnerships" have changed throughout Europe. There is no standard definition of "public-private partnership" that can be found in all studies because there isn't one that everybody in Europe acknowledges. Presenting the development of "public-private partnerships" throughout Europe and emphasizing their ascent and fall, is the primary output of this study. Additionally, this study aimed to demonstrate the current status of this kind of cooperation throughout Europe and the interest that European nations have shown in "public-private partnerships". The market for "public-private partnerships" in Europe has been expanding gradually since 1990. Since then, Great Britain has dominated the market for public-private partnerships for a considerable amount of time. This is a country where interest in this kind of cooperation has grown. In this study, we attempted to draw interest in the time when Great Britain was the front-runner and the point at which other states overtook it. The recent development of public-private partnerships in Europe was given also special attention by presenting the states who are paving the way in implementing PPP projects together with the governments that have only recently concentrated on doing so.*

Keywords: *Public-private partnership, Europe, Cooperation, Projects*

JEL Codes: *O16, P45, R11*

1. Introduction

The "public-private partnership" as it stands now does not originate from ancient times but has its roots in earlier types of "public-private sector cooperation" that first surfaced on the European continent several centuries ago. In contrast to conventional procurement methods, "public-private partnerships" have demonstrated the capacity to reduce whole-life costs, lessen the financial load on the public sector, enhance the management of risks and maintenance services, and foster long-term partnerships that foster transparency and responsibility. Because of

the extended contractual period and collaboration among the public and business organizations, "public-private partnership" projects have more complex structures. The United Kingdom, which has been one of the biggest global markets for "public-private partnerships", is one country in Europe where over time, "public-private partnerships" have been utilized in many different contexts. It has only been in recent years that France and Germany have surpassed the United Kingdom as the continent's top user of this kind of partnership. Across Europe, "public-private partnerships" can be found in several sectors, depending on the needs of the nations in which they were born, including transportation, defense, the environment, education, health, television, culture, and leisure. Using these collaborations with private actors, the European Union consolidates its resources to address Europe's most pressing issues, bolsters competitiveness to furnish superior employment opportunities, and stimulates higher levels of private investment in technology development and research (E.C., 2023).

2. Theoretical background

Determining the meaning of "public-private partnership" is challenging since it is a contextual concept that relies on the activity sector as well as the institutional and legal environment. There are numerous attempts to define "public-private partnerships" in the literature; these definitions are united by the emphasis they place on PPP as a substitute for traditional long-term public service delivery methods. One of the earliest descriptions of "public-private partnerships" as they exist nowadays describes them as an agreement between two or more parties that permits them to collaborate toward mutually beneficial objectives and in which there is a certain level of shared risk-taking, resource investment, authority, and responsibility - sharing, and mutual profit (Roehrich, J.K. et al., 2014). Another definition that helps us better understand the above-mentioned term is the one that characterizes the "public-private partnership" as "a long-term agreement wherein a private company and a government agency work together to supply a public good or service, with the private company bearing the majority of the risk and management duties and receiving payment based on the quality of the work" (World Bank, 2020). These definitions make clear that the government, local public administration, and the private sector, which includes non-governmental groups, are the primary players.

"Public-private partnerships" aim to achieve is to apply creative resource usage and management expertise to obtain the best possible outcomes for all parties engaged in attaining their goals that would not have been possible without the other parties. (DESA, 2016). The public sector's duties and responsibilities change at different phases of the project involving public-private collaboration. The public sector's first issue in a "public-private partnership project" is evaluating and choosing appropriate "public-private partnership" initiatives (Wang, NN et al., 2020). Contrary to privatization, which transfers responsibility to the private partner, "public-private partnerships" do not include a transfer of ownership; instead, the public sector continues to be accountable for delivering the public service (Nastase C. et al., 2022). Although the nature and outcomes of "public-private partnerships" are similar

to those of traditionally awarded projects, there are some distinctions in project management and the contracts that are created (CCE, 2018). In these kinds of "public-private partnerships", the private sector participates in a couple of the several phases or aspects of the procedure used to make policy, such as establishing an agenda, negotiation, putting resources into place, monitoring, and/or enforcement. When public actors are unable to complete a task, private actors can complete it more quickly or effectively (Marx A., 2019).

The institutional quality and competence of local governance determine the adoption of "public-private partnership". "Public-private partnerships" are hindered by several factors, like a deficiency of institutional backing, mistrust between the governmental and private spheres, and inadequate public sector project planning. Establishing trust is crucial for its successful implementation. "Public-private partnership" success is also influenced by suitable rules, clear legislation, open procurement practices, and clearly defined roles for all parties involved. To optimize the advantages of infrastructure and provide the best possible socio-economic results, the market environment must be open and transparent. Public and business sectors' access to information fosters predictability, builds trust, and guarantees that private investments are aligned with the public interest (Yang F. et al., 2022). Because of the pressing need for long-term planning to deal with urbanization, population increase, and environmental deterioration, many governments in industrialized and developing nations place a high value on "public-private partnership". Numerous countries have demonstrated insufficient financing or resources, even when it comes to safeguarding public health during pandemics. This adds credence to the idea that PPP is a wise development strategy. Mutual benefits result from partnerships where the "private sector" (like in the case of the worldwide COVID-19 epidemic) occasionally needs financial assistance and government support (Jayasena N.S. et al., 2022).

The primary advantages of "public-private partnerships" for the state involve reduced government spending, the promotion of innovation and expertise, efficient project management and enhanced project efficacy, the general encouragement of economic growth (both local and central), and, above all, the augmentation of the quality-price ratio. (UNDP, 2021). In addition to providing budget accuracy by establishing both the present and future prices for infrastructure projects, this kind of contract encourages the private sector to finish tasks under budget and on time. Additionally, it provides support to the public sector to satisfy the growing demand for development infrastructure (World Bank, 2022). By using a "whole life" strategy, it is possible to guarantee long-term advantages by combining the conception, financing, construction, management, and maintenance parts of a project into one contract. Sharing risks and allocating them to the part most capable of managing them has a big advantage. (CCE, 2018). The "public-private partnership" faces a variety of risks, some of which are as follows: technical risk, which stems from errors in engineering and design; construction risk, which arises from improper construction methods, cost overruns, and construction delays; operational risk, which results from longer-than-expected costs associated with operation and maintenance; revenue risk, which stems from the inability to extract resources, volatility in prices and demand for goods and services sold, and insufficient revenue; financial and fiscal risk, which results from inadequate coverage of sources of income and financing

costs; political force and regulatory risk, which arises from changes in legislation or hostile and/or inconsistent government policies; and natural force, which is a major risk (UNECA, 2021). While the public sector is better suited to anticipate, reduce, and amortize some risks, the private sector is more suited for others. If both sectors can identify financial hazards ahead of time, none of the sectors will be able to predict the risks associated with natural disasters, even though both can mitigate their consequences. The government and concessionaires, who are stakeholders in "public-private partnership projects", must share the risks equally. This will result in varying perspectives, capacities, and goals. To attain the intended outcomes, risk distribution across the public and commercial domains is crucial (Bashar et al., 2021). To guarantee that government budgetary risks are adequately managed, a thorough risk-sharing model should be created for each PPP project, and each project contract should include the proper distribution of danger to both the public and private sectors (UNECA, 2021). Developing a "public-private partnership" concept and targeted programs for PPP development, which would specify precise guidelines for dividing up partner responsibilities and risks, would be the first step toward mitigating these risks, which are inevitably connected to improving the "public-private partnership" mechanism's effectiveness. (Anopchenko, 2019).

3. Analysis and discussions

To analyze and interpret the global experience in implementing public-private partnerships, I employed the qualitative technique in this research. The technique worked well to illustrate how "public-private partnerships" have evolved in the European region.

According to the environment, culture, and legal system, "public-private partnerships" have developed as a form of cooperation in many European states. (ENISA, 2023). As indicated by the European Center of Expertise "in the area of public-private collaborations, 1749 initiatives carried out through public-private partnerships, with a total value of 336 billion euros, benefited from financial closure on the European market of such partnerships between 1990 and 2016". The market for "public-private partnerships" had a significant ascent in volume before the global financial crisis, but a significant fall in new projects of this kind began in 2008 (CCE, 2018).

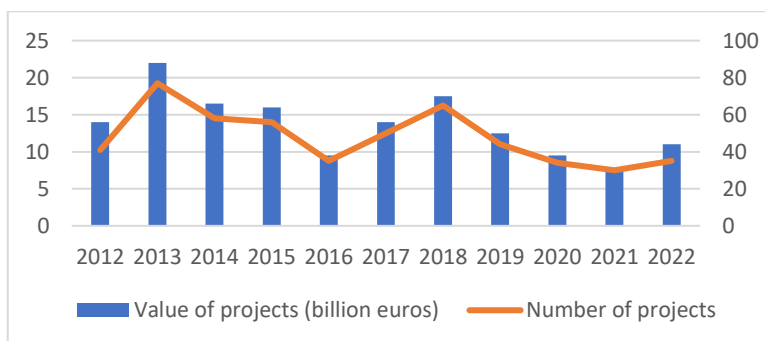


Figure No. 1: The public-private partnership market's development in Europe between 2012 and 2022

Source: processing after EIB, 2022, 2023

The European market for “public-private partnerships” saw alternating growth between 2012 and 2022, with an ascent and fall in the number of projects., which is highlighted in Figure No. 1

By paying close attention to the “public-private partnerships” recent development, we can see that 40 transactions totaling 8.0 billion euros in value reached financial closure in 2021 (EIB, 2022), while 45 “public-private partnerships” deals with a combined value of 9.8 billion euros were completed financially in 2022 (EIB, 2023). The market's value fell by 13% in 2021 compared to 2020, about €9.2 billion (EIB, 2022). In 2022, however, the market experienced a growth of 17%, or €8.4 billion, over 2021 (EIB, 2023). Demand-driven “public-private partnerships” accounted for just 8% of deals to financial close in 2012; by 2021, demand/revenue concluded deals had climbed to 68% from 61% in 2020, representing a considerable increase (EIB, 2022). By 2022, 70% of all deals will be driven by demand or revenue and have reached a financial closure (EIB, 2023). Despite the volatility and unpredictability of construction pricing, the consequence of COVID-19 was less severe than anticipated, as evidenced by a small decrease in the amount of “public-private partnership” contracts finalized in the year 2021 and the rise in terms of quantity and worth of “public-private partnership” initiatives in 2022.

In Europe, “public-private partnerships” are mostly available in the United Kingdom, France, Spain, Portugal, and Germany, nations that have carried out projects with a combined value of 90% of the market from 1990 to 2016. 13 of the 28 EU member states have each implemented fewer than five “public-private partnerships projects”, despite some states carrying out a large number of these projects — the United Kingdom, for example, carried out over 1,000 projects worth roughly €160 billion during the period, followed by France with 175 projects worth roughly 40 billion euros (CCE, 2018), as illustrated in Figure No. 2

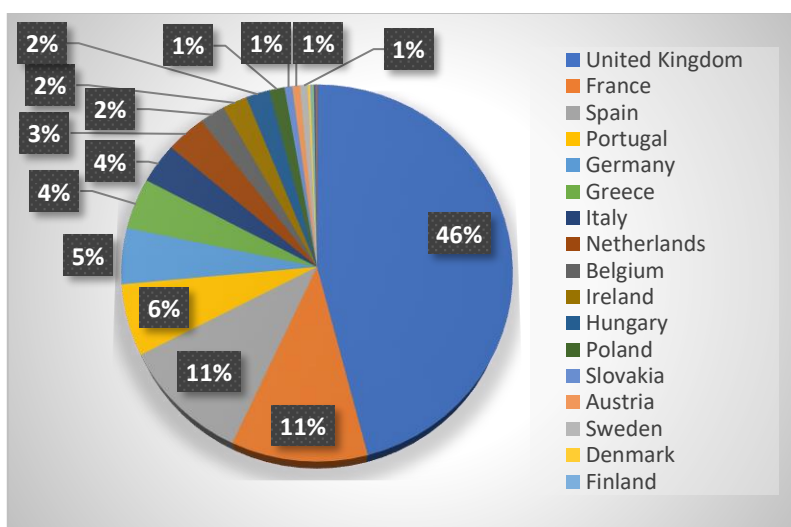


Figure No. 2: The EU market for public-private partnerships across its member states between 1990 and 2016

Source: processing after CCE, 2018

The European market for “public-private partnerships” has shifted between 2018 and 2022. The UK fell out of first place, with Germany and France taking its place. In contrast to the previously examined time more of these partnerships were formed by nations like Lithuania, Poland, Serbia, and Croatia, whereas Spain saw a decline in these kinds of alliances, as shown in Figure No. 3

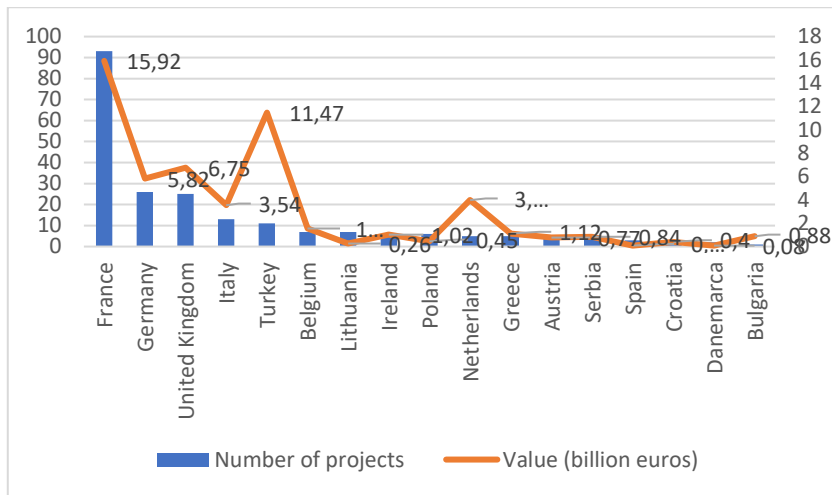


Figure No. 3: The development of public-private partnerships in Europe, broken down by nation between 2018 and 2022

Source: processing after EIB, 2023

Regarding the total number of closed deals in the European “public-private partnership sector”, the United Kingdom and France have become the front-runners over the past five years (EIB, 2023). At least one “public-private partnership” agreement was completed in 13 different nations in 2021 contrasted with 11 in the year 2020, and five countries finalized at least two deals in 2011 as in 2020 (EIB, 2022). Nine nations completed two or more contracts in 2022, and fifteen countries completed one or more “public-private partnership” transactions (EIB, 2023). In terms of overall value, Italy accounted for the biggest “public-private partnership” market in Europe in 2021, with €2.2 billion, up from €473 million in 2020. The €2.1 billion “Pedemontana Lombarda Motorway Concession” is the reason for the exceptionally significant value of projects in Italy. With 17 completed deals, France constituted the largest “public-private partnership” market in terms of overall projects, which is the same as in 2020. In terms of value, however, France ranked second with a total of €1.4 billion instead of €2.4 billion in 2020 (EIB, 2022). With an overall value of €4.2 billion in 2022 instead of €1.6 billion in 2021, France emerged as the biggest market in Europe for “public-private partnerships”. Additionally, the country closed 21 transactions in 2022 as compared to 18 in 2021, making it the market with the greatest quantity of initiatives. With a total of EUR 2.0 billion, Turkey

ranked as the second-most valuable market for "public-private partnerships" (EUR 1.4 billion in 2021). With four completed transactions, Germany ranked second among "public-private partnerships" markets in terms of the total number of finished transactions. (EIB, 2023).

The entire amount of 64 "public-private partnership projects" on the European market that were successful in reaching a financial close in 2016 was 10.3 billion euros. The majority of the projects were aimed at the transportation industry, which accounted for one-third of all "public-private partnership" investments in 2016. This was followed by the industries providing health services and education. (CCE, 2018). The transportation industry will continue to receive the majority of investment between 2018 and 2022, with two more sectors — the environment and television — joining it, depending on the number of projects and their total value (measured in billions of euros). Transport is the largest industry in 2021, accounting for EUR 6.0 billion in transactions, up from EUR 5.8 billion in 2020. Out of the 12 projects that reached financial close in 2020, 16 reached financial close in 2021. The environment sector, which had nine closed projects with a total value of EUR 866 million in 2021 as contrasted with EUR 658 million in 2020, featured four projects totaling EUR 385 million in district heating, and all of them were located in France. Regarding the quantity and value of projects completed, this sector is the second most active. Within the education sector, from 11 projects in 2020 to 5 in 2021, fewer projects reached financial close, and the total value dropped from €866 million in 2020 to €391 million in 2021. The telecom industry completed three projects in 2021, each of the three deals happening in France, as opposed to four in 2020, with a total value of EUR 427 million, down from EUR 1.1 billion in 2020 (EIB, 2022). With transactions of EUR 5.2 billion (compared to EUR 6.0 billion in 2021), in 2022, the transportation industry remained the largest by value. The number of projects grew, with 17 transportation projects, up from 16 in 2021, reaching financial close in 2022. This comprises four ports as well as four highways. Five thermal efficiency projects for a total of €576 million, all located in France, were among the ten environmental projects totaling €1.3 billion that were halted. Three projects with a total value of EUR 231 million (EUR 427 million in 2021) were closed in the telecommunications sector, and the number of financially closed projects in the education sector climbed from five to eight, with an overall value of EUR 910 million. By the number of current projects, the transportation sector remains the largest in 2021. The environment, education, health, media, and other sectors follow in order, and this hierarchy will be maintained in 2022 (EIB, 2023).

Institutional investors, including insurance firms and pension funds, provided loans through various financing models in 14 out of the 40 deals that concluded financially in 2021 (whereas they provided debt in 10 out of 43 transactions in 2020) (EIB, 2022). In 2022, institutional investors, including insurance companies and pension funds, provided finance through various financing structures in 17 out of 45 agreements that were completed financially (EIB, 2023). While three nations concluded acquisitions with institutional investors in 2020, seven nations profited from institutional investor activity in 2021 (EIB, 2022), and eight nations won from institutional investor participation in 2022 (EIB, 2023).

In terms of initiatives, the countries with the most activity in the year 2021 are France with 53 projects, Belgium with 25 projects, and Italy with 19 projects (EIB, 2022).

France leads the group of countries with the most continuing projects (2022) with 50, Italy comes in second with 32, and Greece comes in third with 28. The remaining countries are listed in the order shown in Figure No. 4

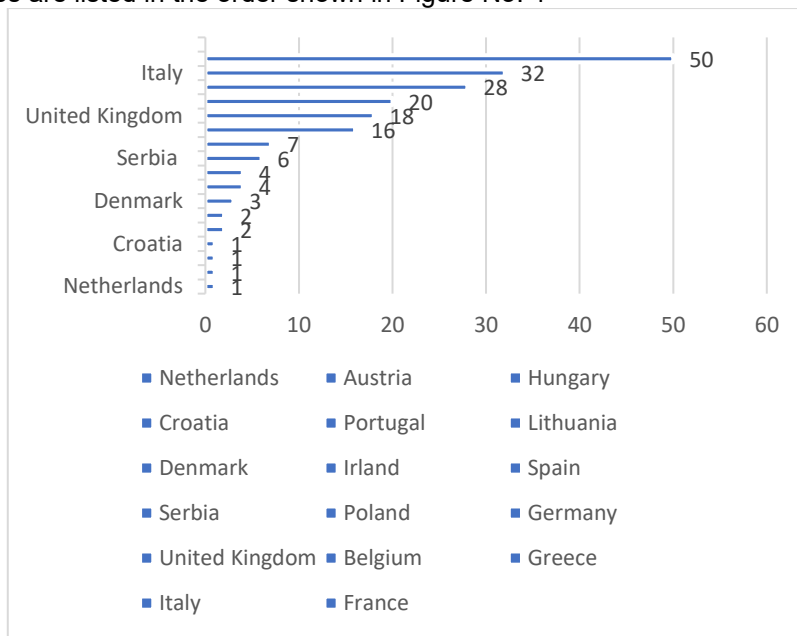


Figure No. 4: Ongoing projects at the level of 2022

Source: processing after EIB, 2023

Greece has established a strong network over the last three years, showcasing its ability to combine EU financing with initiatives involving public-private partnerships and its success in obtaining them. In Greece, projects related to education and the environment make up half of the total. Five of the nine environmental initiatives deal with water management. "Public-private partnership" models are still utilized in many industries around the UK, including energy-from-waste, care facilities, and student housing, even though the central government of the UK has stopped accepting PFI and PF2 applications for new projects.

4. Conclusions

Examining Europe's progress in "public-private partnerships" is pertinent because of the interest in "public-private cooperation" that has been on this continent since the Roman Empire's era. This interest has taken on various forms until it reached its current state. However, in many states, this form has changed in response to local cultures, legal systems, and environmental factors. The term "public-private partnership" lacks a universally recognized definition but there are some interpretations that exist. The three main points that these definitions emphasize are the size of the contract, the sharing of risks, and the roles of the parties in these

projects. In addition to its many advantages, "public-private collaboration" carries many dangers that, if not effectively managed, could fail.

About this kind of cooperation, it should be mentioned that there have been instances where the "public-private partnership" has experienced an ascent due to governmental and financial backing, as well as a fall. In 2007, it achieved its peak in terms of the adoption of these partnerships. The impact of the economic crisis led to a discernible drop in the quantity of new "public-private partnership" initiatives. There was a period of oscillation during which the number of projects increased and decreased. If, up until 2016, the United Kingdom, France, Spain, Portugal, and Germany accounted for 90% of the European market for "public-private partnerships", then after that year, the market changed, with France and Germany taking the lead and the United Kingdom losing its top spot. Apart from the UK, Spain's market for "public-private partnerships" also showed signs of a downturn. However, certain nations are benefiting from the growth of these kinds of alliances, including Lithuania, Poland, Serbia, and Croatia. Greece, which has lately established a strong network in this area, is a successful example of a "public-private partnership". The following are some of the primary industries in which "public-private partnerships" had their start on the European scene: infrastructure, education, defense, health, transportation, and the environment.

Despite the consequences generated, the influence of COVID-19 on the "public-private partnership" was not as profound as anticipated. Events that might affect how "public-private partnerships" develop in Europe include the uncertainty brought on by the possibility of a new financial and economic crisis on the continent and the instability generated by wars on a worldwide scale that also has an impact on the European market. Future studies on novel variables that may impact the growth or decline of "public-private partnerships" in Europe are therefore yet possible.

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SARS-COV-2 INFLUENCES IN HOSPITAL FUNDING

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Abstract: *The challenges to which all health systems in the world are subjected put pressure on the government to find solutions, mainly for their financing, but also the possibility of ensuring the highest possible level of quality of the medical services provided to the population.*

During the SARS-Cov-2 pandemic, very often, health systems have been outdated and unable to provide medical services at the expected level, including in countries considered to offer medical services at the highest level.

Spending on supporting health systems during the pandemic has been substantial, with each state applying different strategies to support the health system, especially hospital units.

In Romania, half of the budget allocated to health is spent by hospitals, and during the pandemic they have benefited from a series of facilities in order to support their activity and ensure the medical services offered to patients.

Among the extremely important measures taken in Romania, during the pandemic, there is the financing of hospitals at the level contracted with the health insurance houses, given the limitation of patients' access to the medical services offered in hospitals.

This paper is based on qualitative and quantitative research of the indicators in six hospital units in the west of the country, which analyzes the level of funding and the rate of bed use before the pandemic and the challenges after it.

The conclusions of the study show that the rate of use of beds in analyzed hospitals is decreasing, especially influenced by the pandemic period, which leads, in addition to the increasing costs necessary for operation, to additional pressures in providing the necessary funds to provide medical services to patients.

Keywords: *the impact of the pandemic on hospitals, hospital funding, bed use rate*

JEL Classification: A12; H51; I15; I18; P46

1. Introduction

The period of the SARS-CoV-2 pandemic has subjected health systems around the world to countless pressures, both of a medical nature, to find appropriate solutions and treatments for treating patients, and of a financial nature, the governments of the countries being forced to substantially supplement the budgets allocated for health.

In the early period of the pandemic, hospital spending increased exponentially, especially for the provision of protective materials and equipment, the market not being prepared to cover the extremely high demand, as well as the possibility of

purchasing equipment and consumables necessary for testing the population, and in aggressive waves, hospital units needed the necessary funds to cope with the extremely high influx of patients.

In the face of these challenges, the governments of the countries have adopted different strategies to support the health systems, which have often been overwhelmed, by managing the pandemic with the involvement of several institutions and especially by providing the necessary financial funds.

During the pandemic, Romania created county command centers, coordinated from the central level, in which were mainly involved institutions within the Ministry of Internal Affairs and the Ministry of Health, and the hospitals financed by the contracts concluded with the health insurance houses benefited from exceptions regarding the settlement at the entire contract value, regardless of the number of patients admitted.

The specialized staff involved in the transport, diagnosis, equipment, evaluation, diagnosis and treatment of patients diagnosed with Covid-19 benefited from a risk incentive in the amount of 2,500 lei gross monthly (OUG 43, 2020), and the staff who effectively participated in the application of the measures to limit the epidemic, benefited from increases ranging from 55% to 85% of the basic salary (HG 153, 2018).

Thus, during 2020 – 2021, bonuses or incentives totaling 470,105 thousand lei were granted for a number of 398,302 employees, and 32 projects were also carried out through the POIM for the endowment of hospitals (CCR Report, 2023).

Also, substantial funds were allocated from the state budget for the purchase of protective equipment, medical devices and specific anti-covid treatments, the situation being reflected in the percentage increase of funds allocated to health, respectively 5.5% of GDP for 2020, compared to 5.0% in 2019 [Eurostat, 2023].

The pandemic period has strongly influenced the addressability of patients to hospital medical services, registering a steady decrease in the number of cases, which leads to a decrease in the incomes of hospital units and puts additional pressure on them.

2. Literature review

During the SARS-CoV-2 pandemic, all health systems in the world have been subjected to extreme challenges both from a medical and financial point of view, regardless of the strategy adopted by each country, the pressure being mainly on hospital units, especially on certain specializations, but also on other medical service providers (Elie M. Ferneini, 2020), (Frank J. Lexa, 2020), (Sanjay S et al, 2020).

Hospital expenses have increased substantially, with hospitalized patients requiring longer periods for recovery, in most cases not covered by settled amounts, and limitations on admissions have led to reduced revenues (Michael L. Barnett et al, 2020), (Alan D. Kaye et al, 2021).

The expenses incurred in treating covid-19 patients are difficult to estimate (Beck da Silva Etges et al, 2021), with very large decreases in hospital admissions (Kruse FM, 2020), (Shin J-h et al, 2020), which led, in some cases, to the closure of hospitals as they failed to cope with the high expenses (Saghafian, S. et al, 2022). Some specialized studies analyze the strategies adopted by the states to compensate for the differences between the revenues obtained by hospitals and the increasing expenses (Ruth Waitzberg et al, 2022), during the pandemic period most countries have not changed the financing mechanisms, being granted complementary amounts from the budget, while others have introduced new tariffs for medical services (Quentin, Wilm, et al, 2020), (Waitzberg, Ruth, et al, 2020), (Erik Hefti et al, 2022).

3. Research methodology

The present study analyzes the impact of the SARS-CoV-2 pandemic on six hospitals in the west of the country, from the perspective of the number of cases treated, respectively the revenues obtained, compared to the period before the pandemic.

During the research, we analyzed the official data on the number of cases admitted in the six hospitals in 2012, 2019 and the period 2020 – 2022, making a graphical representation of the evolution of this indicator, based on the reports on the indicators of hospitalized morbidity.

For the period 2012 – 2022 we have aggregated the data from the financial statements, according to the reports on the budget execution of the six hospitals, namely: Alba Iulia County Emergency Hospital, Arad County Emergency Clinical Hospital, Deva County Emergency Hospital, Reșița County Emergency Hospital, Sibiu Emergency County Clinical Hospital and Timișoara Emergency County Clinical Hospital, with a view to determining the evolution of the surplus or deficit recorded for the 11-year period under review.

The qualitative research was carried out by studying the articles of interest for the studied topic, having as main themes the impact of the pandemic on the financing of health systems, especially on the indicators that generate income within them.

The findings of the present research show that, in addition to the financial pressure on health budgets, there is a major impact on addressability within hospitals, with the number of hospital cases being decreasing, which leads to diminished revenues and the impossibility of hospitals to cover expenses or to develop through new investments.

4. Situation of hospital financing in Romania

Budgetary allocations for health in Romania, relative to GDP, are among the lowest in the European Union, and more than half of them are spent by hospital units.

By aggregating the data and analyzing the financial statements reported by the analyzed hospitals, between 2012 and 2022, it is observed that the financial results are heterogeneous, with high fluctuations from one year to the next (Table 1).

Table 1: Situation regarding the annual Surplus/Deficit (thousands of lei)

County Emergency Hospital	2012	2013	2016	2018	2019	2021	2022
Alba	137	-63	-310	-164	-582	4.038	7.551
Arad	792	4.214	786	784	321	-4.019	114
Hunedoara County	-4.525	132	832	5.361	2.023	1.288	4.305
Caras-Severin	0,00	557	917	328	279	272	153
Sibiu	1.122	-708	4.568	1.214	8.494	16.773	19.414
Timiș	1.059	-6.930	-393	-9.569	-800	-2.006	-3.259

Source: Author processing from hospitals' financial statements www.ms.ro

As can be seen, with the exception of one hospital, all hospitals have faced financially difficult situations over the period under review, with substantial deficits at the end of the year.

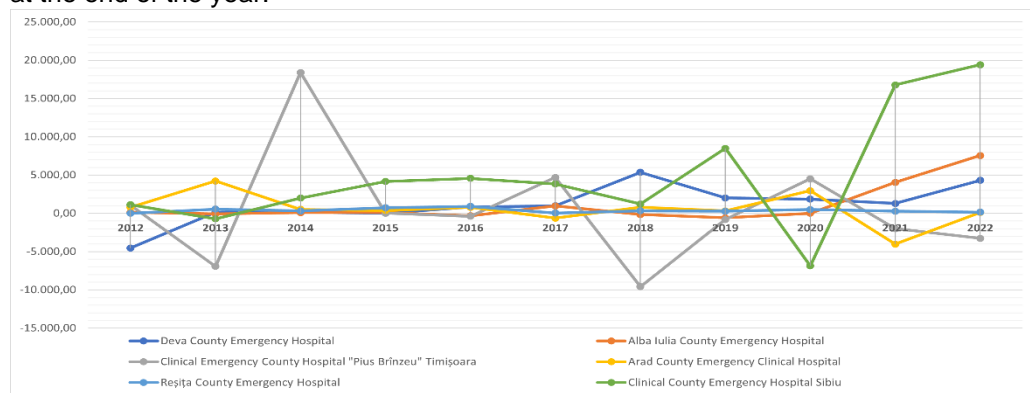


Figure 1: Evolution regarding the Annual Surplus/Deficit, in the period 2012 – 2022, (thousands of lei)

Source: Author processing from hospitals' financial statements www.ms.ro

The average income of the hospital units, for the period of 11 years analyzed, is positive being recorded in surplus in the aggregate financial statements, but the evolution is uneven and there is no constancy in the realization of incomes, and the values are relatively low, which makes it impossible to forecast capital investments necessary to improve and increase the quality of the medical act (Figure 1).

The situation regarding the number of cases treated in the six hospital units analyzed shows us that there is a major decrease during the pandemic, motivated

by the limitations imposed on the acceptance of only medical emergencies, as well as by the avoidance of patients accessing hospital services for fear of infection with Covid-19 (Figure 2).

Compared to 2019, there is a decrease of over 12,000 cases treated, in the period 2020-2021, especially cases of patients with Covid-19 infections and medical-surgical emergencies.

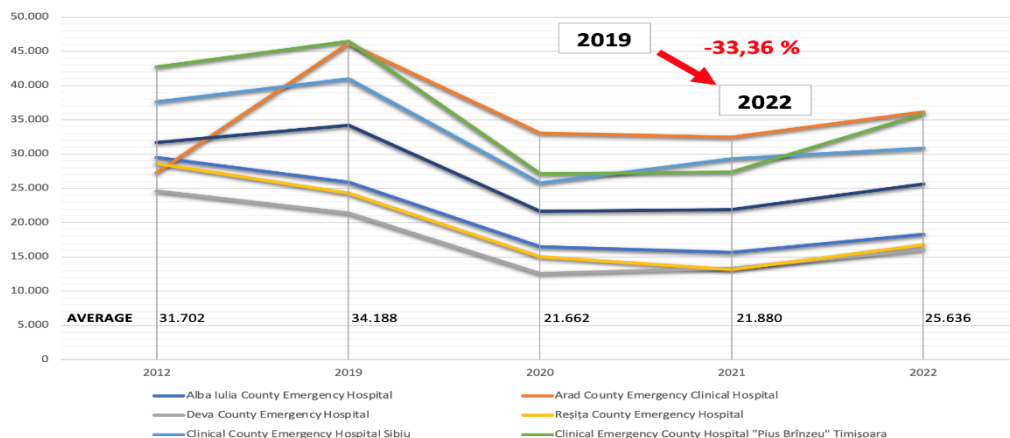


Figure 2: Evolution in the number of cases for the hospitals analysed

Source: Author processing from hospitals' financial statements www.ms.ro

For 2022, there is a moderate increase, but insufficient to ensure the necessary revenues to cover all the expenses incurred by hospitals, which also benefit during the year from certain exceptions regarding the financing, respectively the settlement at the full value of the contract, regardless of the number of patients admitted.

In 2022, there is a decrease of 33.36% in the number of cases treated in the analyzed hospitals, compared to the year before the beginning of the pandemic (2019), respectively an insignificant increase compared to 2021.

Table 2: Situation regarding hospitalized cases and surplus/deficit Trim. I (thousand lei) – 2023

Hospitals	Cases	Excedent / Deficit
Alba Iulia County Emergency Hospital	5.175	5.779
Arad County Emergency Clinical Hospital	9.846	-14.349
Deva County Emergency Hospital	4.980	3.749
Reșița County Emergency Hospital	5.205	-23.645
Clinical County Emergency Hospital Sibiu	8.222	-563
Clinical Emergency County Hospital "Pius Brînzeu" Timișoara	9.876	13.727

Source: Author processing from hospitals' financial statements www.ms.ro

For the first quarter of 2023, all hospitals register a low number of hospitalized and treated cases, and keeping the current trend will register at the end of the year values below those recorded before the SARS-Cov-2 pandemic (2019), meaning that hospitals will have difficulties in providing medical services at the entire amount contracted with health insurance houses.

Regarding the financial results for the first quarter, there are substantial deficits in half of the hospitals analyzed and surplus in the others, the situation being also influenced by the recording of overdue payments.

5. Conclusions

The influences of SARS-CoV-2 on the health system were major, with an impact on all components of the system, from medical staff, therapeutic protocols or equipment, to the pressure on the allocated budgets.

In order to deal with the pandemic period, the executive took measures to finance hospitals with funds from the state budget, to cover the expenses incurred, the main measure being the development of normative acts that allow the full payment of the amounts contracted with health insurance companies, regardless of the number of patients or the medical services provided.

Starting in 2023, the financing facilities were removed, and hospitals returned to financing according to the services offered, without taking into account the impact of the pandemic on the address of hospital services.

There is a significant change in the behavior of the population regarding the access to medical services, which is also confirmed by the evolution of the number of hospitalized cases.

Patients use the services provided by hospitals in particular through emergency services, with requests for outpatient treatment of conditions or day hospitalization services.

Also, another effect of the pandemic is manifested by the tendency of hospitals to artificially increase the rates of use of beds by prolonging hospitalization periods also for cases with low complexity, which generates additional costs, and finally, at reduced settlement values by decreasing the complexity index of cases on the basis of which their financing is calculated.

Keeping a high number of beds in hospitals, among the largest in Europe, generates high costs for hospitals, with medical staff being sized according to them, and the low rat index of bed use is a component of the funding calculation formula.

In order to establish as fully as possible the influence of the SARS-CoV-2 pandemic on the financing of the hospital units, it is also necessary to analyze, in addition to the number of hospitalized cases, the average duration of hospitalization, respectively the rates of use of beds and the complexity of the hospitalized cases, all these indicators influencing the amounts settled by the health insurance houses.

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DECISION TREE OR LOGISTIC REGRESSION - WHICH BASIC MODEL IS BETTER?

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Abstract: *In this paper, my aim is to show which of the data in the Central Credit Information System are the ones that influence the factors that are then used to perform the analysis using a decision tree and logistic regression, and I would like to know, which of the two basic model is the better one. For the analyses, I used a random sample of 500 items, reflecting the proportions of performing and non-performing loans in the population. For both methods, one variable was found to be significant, which was the ratio of the repayment to the contract amount, so this is the most significant of the data recorded by the Central Credit Information System in terms of loan defaults. If I compare the two methods, I can conclude that both methods have a high level of accuracy, but logistic regression is the one that produced better results, as it was able to identify a higher proportion of defaulted loans. Unfortunately, the decision tree could not identify any defaulting loans despite its higher classification accuracy. The reason can be the unfavourable sample composition. Finally, the logistic regression was able to categorize the transactions with 81,1% accuracy and has better AUC value and better value for Gini coefficients.*

Keywords: *loan default; decision tree; logistic regression, random sample; classification; ROC curve*

JEL classification: B16; C38; C44; C53

1. Introduction

It is important for financial institutions to lend to customers with a low risk of non-repayment. However, it is difficult to identify which customers become defaulters. This is evidenced by the fact that banks have a credit assessment method, but there are still many non-performing loans registered in our country.

There are a lot of research on predicting corporate bankruptcies over the last 100 years, and I have based my own research on this. In this research, my goal is to examine the confidence with decision tree and logistic regression can categorize defaulted loans, which variables are significant among the data recorded by the KHR or calculated based on KHR data and which method is better using different evaluation methods.

1.1 Bankruptcy models

Bankruptcy forecasting research does not yet have a 100-year history. The first attempts were made in the 1930s. The first real model was created by Altman, who built his model on 5 financial indicators that could predict insolvency with 95% confidence. A few years later, an extended seven-variable model was developed based on this model (Altman, 1968; Virág, 2004). Altman's models were not representative, and the sample included roughly equal proportions of surviving and failing firms. (Ohlson, 1980) The next novelty was the emergence of recursive partitioning algorithms, which dates back to the mid-1980s. Among the first adopters of this method were Altman, Frydman and Kao. The classification accuracy of the model was 94%, but there was a significant difference in the correct categorisation between surviving and failed firms (Frydman et al., 1985)

In the 2000s, McKee-Greenstein also attempted to carry out analyses using this method, but in the end the use of recursive partitioning algorithms did not spread in the literature (McKee-Greenstein, 2000).

2. Bankruptcy Methods

For bankruptcy forecasting discriminant analysis, logistic regression, decision tree and neural network are widely used. For this study I used decision tree and logistic regression.

2.1. Decision tree

This analysis is one of the classification methods. The resulting subgroups are called nodes. The basis for the prediction is the leaves, which are the part of the tree that is not further divided (Hajdú, 2018)

Its use in bankruptcy prediction dates back to the 1980s. The method combines univariate and multivariate analyses, as 1-1 splitting is done by one variable, but overall it includes more variables in the analysis. At each step, the algorithm tries to reduce misclassifications. The algorithm is an iterative process designed specifically for computers. There are several types of decision trees and I used the CHAID.

The great advantage of the analysis is that there is no restriction on the variables included, both metric and non-metric variables can be included.

An argument in favour of this method is that the conditions do not include a normal distribution of variables. It is easiest to apply when there are binary separations. As a result, a high proportion of the population is assigned the appropriate solvency classification, the exact classification data can be found in the classification matrix.

The disadvantage of this methodology is that it cannot be used for forecasting purposes, as it is mostly specialized for the training database. However, the problem can be solved by using the method developed to control over-learning in artificial intelligence models, i.e. by dividing the data into a training and a testing part and examining whether similar results are obtained in both cases (Hámori, 2001)

2.2 Logistic regression

In logistic regression, the goal is to classify observation units into predefined groups of dependent variables. In this case, the dependent variable has two categories, so I applied binomial logistic regression. In logistic regression, the analysis is based on

the "odds", which determine the probability of the default. The odds can be expressed by the following formula:

$$odds_x = \frac{P_x}{1 - P_x}$$

In the logistic regression, we assume that the logarithm of the odds can be defined as a linear function of the independent variables, which can be written as follows:

$$\ln(odds_x) = \text{logit}(P_x) = \beta_0 + \beta_1 x_1 + \dots + \beta_p x_p$$

The other central element of the analysis is the so-called cut point value. This value can be chosen arbitrarily, but it is important to keep in mind that the losses resulting from a false classification are kept to a minimum. (Hajdu 2003; Malhotra 2008; Sajtos & Mitev 2007; Varga & Szilágyi 2011)

3. Database

In Hungary, information on household creditors is kept by the Central Credit Information System, or KHR, which helps banks to share information on creditors, assist in credit assessment and reduce the risk of over-indebtedness. The KHR maintains a so-called complete list, i.e. customers who meet their obligations on time are also included in the register.

The necessary database for the analyses was provided by BISZ Zrt. The data were extracted on 30 September 2021, so the database contains the persons registered on that date. A unit in the database represents one loan transaction, so there may be persons in the database who are listed more than once with different loan transactions. Overall, on that date, the register contained 10.767.452 credit transactions and 21 variables. In addition to the original variables, I added more variables to the database. For the analysis the relevant variables are default, age, gender, loan maturity, repayment amount as a percentage of contract amount.

Before starting the analyses, the first step was to clean the database and narrow it down to the research objectives; after that I had 2,887,470 cases in the database. For the analysis I used a database with 500 cases. For the sampling I used a random numbers generator and simple random sampling. This is a type of representative sampling.

I classified as default the loan transaction that had a default amount.

4. Empirical research

Recent methods used for bankruptcy prediction include decision tree, logistic regression, and neural networks. I used two of these methods and I assume that these methods can be used to predict with high accuracy which customers or loan transactions will default, also in the case of retail lending.

To support this statement, I constructed classification models using decision tree and logistic regression. To perform the analysis, I used the database provided by the KHR and to validate the results, I divided the sample into a training and a test part. The training sample included 70% of the cases.

4.1 Logistic regression I. model

First, I performed a logistic regression analysis. Of the available explanatory variables, only the ratio of the repayment to the contract amount was found to be significant. The Omnibus test ($p < 0.001$) and the Hosmer and Lemeshow goodness-of-fit test ($p = 0.212$) showed a reliable model with a good fit. The generated model has medium explanatory power (Nagelkerke $R^2 = 38.8\%$).

Table 1: Significant variables in the Logistic Regression I model

Sample		B	S.E.	Wald	Sig.	Exp(B)
Test	repayment ratio	,024	,007	13,249	<,001	1,025
	Constant	-3,594	,499	51,836	<,001	,027
Training	repayment ratio	,029	,004	49,181	<,001	1,030
	Constant	-3,448	,308	125,008	<,001	,032

Source: Own editing, SPSS output

The model equation can be written in the following form:

$$P_{(default)} = \frac{e^{0,032 + 1,030x_1}}{1 + e^{0,032 + 1,030x_1}}$$

Where:

x_1 : the ratio of the repayment to the contract amount.

For the evaluation of the model first I used the classification table.

Table 2: Classification table for Logistic regression I model

		Predicted			
Sample	Observed	Default		Percentage Correct	
		0	1		
Test	Default	0	138	4	97,2
		1	4	4	50,0
	Overall Percentage				94,7
Training	Default	0	261	62	80,8
		1	4	23	85,2
	Overall Percentage				81,1
a. The cut value is ,039					

Source: Own editing, SPSS output

The selected cut-off value is different from the default value of 0.5. There are several recommendations to determine it, of which I used the Youden rule. Youden's rule considered 0.039 to be the optimum value, so I used it. Although the cut off value chosen in this way reduced the accuracy of the classification from 93.7% to 81.1%, it increased the correct categorisation rate for non-performing loans from 40.7% to 85.2% and can therefore be considered as more favourable.

Overall, the model created correctly categorised loan transactions with an accuracy of 81.1%, with 66 items incorrectly categorised. As the cut off value used is low, the

random classification classified all transactions as non-performing and compared to the random categorisation (7.7%), the 81.1% value can be considered as a significant increase.

A significant difference between the training and test sample is observed for classification accuracy, sensitivity and specificity. The sensitivity of the test sample is significantly lower than that of the training sample. This may be due to the predominance of performing loans in the sample, i.e. the sample composition is unfavourable for analysis. To improve this, I will perform the analysis on a new sample in the future, so for the time being I consider this model as final.

Logistic regression imposes several conditions on the analysis, so these conditions need to be checked:

level of measurement of the variables: the dependent variable is a dichotomous variable, and the independent variables can be measured at any scale, so this condition is met.

independence of data: an item represents a loan transaction that is independent of other loan transactions, so this condition is also met.

sample size: sample of 500 items.

multicollinearity: only one explanatory variable was found to be significant in the analysis.

Thus, it can be concluded that the model created meets all the criteria and the validation was successful.

4.2 Decision tree I. model

Before starting the analysis, it is important to note that one of the disadvantages of the decision tree is its tendency to over-learn, which is also a risk in this case, as the sample is predominantly composed of good performing loans (93%).

The algorithm had four explanatory variables, of which the ratio of the repayment to the contract amount proved to be a good discriminating variable based on the algorithm. For the analysis I used a training and a test sample. The decision tree run on the training and test sample is shown in Figure 1.

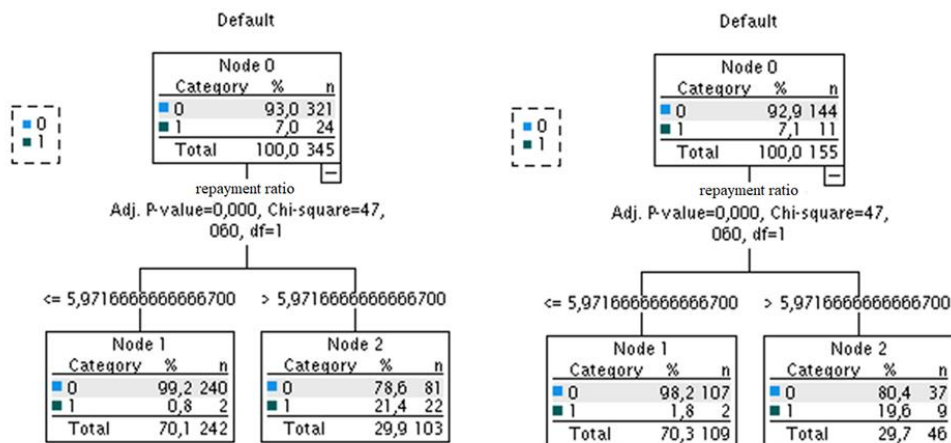


Figure 1: Decision tree for the training and test sample

Source: Own editing, SPSS output

This decision tree consisted of a level 0 and a level 1. Level 0 shows the entire database in one view and the distribution and item number of each category of the dependent variable. This is followed by an iterative process; the algorithm performs the analysis for each explanatory variable and then selects the one that has the greatest influence. In this case, this variable is the ratio of the repayment to the contract amount. If the algorithm then finds more significant variables, the tree is extended by additional levels, if not, the tree ends at that level.

Based on the analysis, it can be found, that in the case where the value of the variable is less than 5.9717, the number of non-performing loans is negligible. Information on the accuracy of the classifications is provided by the classification matrix.

Table 3: Classification matrix for Decision tree I model

Sample	Observed	Predicted		
		0	1	Percent Correct
Training	0	312	0	100,0
	1	24	0	0,0
	Overall Percentage			93,0
Test	0	144	0	100,0
	1	11	0	0,0
	Overall Percentage			92,9

Source: Own editing

For the training database, the model achieved a classification accuracy of 93.0%, but did not correctly categorise any of the non-performing loans. This is because the number of non-performing loans was too low in the sample, so the algorithm overestimated the classification of performing loans. A solution to this problem could be to design a sample with (approximately) equal proportions of performing and non-performing loans.

4.3 Comparison of the models

I based the models on four explanatory variables, and the table below summarises which explanatory variables were found to be significant by the different methods.

Table 4: Summary of variables used by classification models

Name of the variable	Log. regr.	Decision tree
ratio of repayment	X	X
loan maturity		
age		
gender		

Source: Own editing

Based on the above, it can be concluded that the most significant of the data recorded by the KHR in terms of loan defaults is the ratio of the repayment to the contractual amount.

In addition to the classification matrix, I also used the ROC curve, the AUC value, and the Gini coefficient to evaluate the models. On the Figure 2 can we see the ROC curve on the left side for the decision tree, on the right side for the logistic regression.

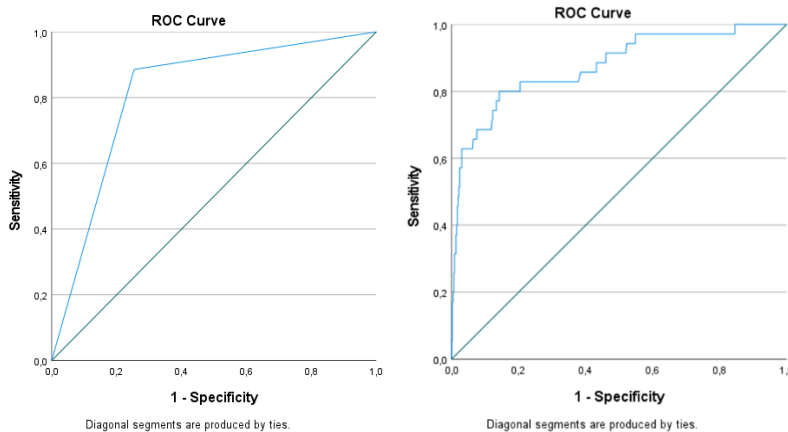


Figure 2: ROC curve for Decision tree I. and for Logistic regression I.

Source: Own editing, SPSS output

Based on the ROC curve can be the AUC (Area Under the Curve) value calculated. The AUC ranges from 0 to 100%, where 100% is considered perfect. If the AUC is around 80-90%, it is considered outstanding.

One other method for the evaluation is the Gini coefficient, which can be calculated in several ways. The simplest way to calculate it is:

$$Gini = 2 (AUC - 0,5)$$

The maximum value of the indicator is 1. If the value is between 60% and 70%, the model is considered to be correct. If the value is above 70%, the model is considered to be good. (Engelman et al, 2003; Olawale, 2020)

Table 5: Evaluation of the models developed using different methods

	Accuracy			AUC (%)	Gini (%)
	0	1	Σ		
Logistic regression	80,8	85,2	81,1	87,7	75,4
Decision tree	100	0	93	81,6	63,2

Source: Own editing

In both cases I achieved a value over 80% for AUC, so the models can be considered as outstanding.

The value of the Gini coefficient is 63,2% in the case of decision tree, so the model can be considered as correct, and in the case of the logistic regression the value is 75,4%, so the model can be considered as good.

5. Summary

In the analyses, I found that when using both methods, one explanatory variable was significant. It can be concluded that the most significant variable of the data recorded by the KHR in terms of loan defaults is the ratio of the repayment to the contract amount. There are significant differences in the evaluation systems. The reason is that in the sample the proportion of performing loans was higher and it is unfavourable for the selected methods. The classification matrix of decision tree showed that none of the cases could the model correctly categorise of the non-performing loans and the Gini coefficient value also indicated that the model is not the best. The accuracy of the logistic regression was lower, but it could categorise the non-performing loans with higher proportion, and the value of the other evaluation methods was higher, but there was a significant difference between the test and the training sample.

There are several possible solutions to the problem. One option is to use a new sample that is more favourable to the analytical methods. Another possible solution is to add new variables to the current sample that are not recorded by the KHR and that may be important in the borrowing process. But answering these questions will be the subject of another study.

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QUETELET, THE FATHER OF STATISTICS

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Abstract: *By the 17th and 18th centuries, two trends in statistics had developed: descriptive statistics and political arithmetic. The main representatives of descriptive statistics were the newly established statistical offices or organisations in the countries. The main task of this movement was to describe the status of the state. Political arithmetic concentrated on the observation of socio-economic phenomena that could be quantified and on the relationships between social phenomena. Adolphe Quetelet, who played a major role in many disciplines, was most active in the field of statistics. He was the man who united the two branches of statistics and one of the people who made statistics a science. He is associated with the founding of many statistical journals and societies, and worked tirelessly to establish international cooperation between statisticians, resulting in the regular International Statistical Congresses. The aim of this article is to summarise Quetelet's work and the history of the International Statistical Congresses, which contributed to the harmonisation of national statistics. Finally, we have examined Quetelet's work in the field of crime statistics because Quetelet focused his attention not only on crime, but also on all the phenomena he believed determined the moral face of society. He also studied the evolution of suicide, divorce, out-of-wedlock births and prostitution. Quetelet recognised that it was possible to improve the state of human societies through appropriate state intervention, but that this required an understanding of the interplay of social processes. It can therefore be said that Quetelet made an outstanding contribution to many important areas of statistics and can rightly be called the father of statistics.*

Keywords: Adolphe Quetelet; the evolution of statistics; theory of statistics; Political arithmetic; Statistical congresses

JEL classification: C00

1. Introduction

Károly Keleti, in his speech at the Hungarian Academy of Sciences on 30 November 1874, said that Adolphe Quetelet "a hero of the whole head outstanding among those who have struggled in the field of statistics". The scientific work of Adolphe Quetelet (1796-1874) was extremely varied. A Belgian polyhistor, he achieved great success

in meteorology, astronomy, mathematics, demography, sociology, criminology and the history of science. He created the body mass index, which is still used today. In 1828, he founded the Royal Observatory in Brussels, which he directed for several years, pioneering the study of meteorites. At the age of twenty-four, he was elected a member of the Belgian Academy of Sciences and was its President from 1832 to 1834, and then its Honorary Secretary from 1834 to 1874. Throughout his life, Adolphe Quetelet was associated with many eminent personalities, including contemporaries such as Pierre Simon de Laplace, Simeon Denis Poisson, and André-Marie Ampiér. At the request of King Leo I of Belgium, he taught mathematics to the Dukes Ernest and Albert of Saxe-Coburg and Gothia, discussed population trends with Malthus, philosophical issues with Goethe, and census issues with James Garfield, the twentieth President of the United States. He was a close friend of Queen Victoria's husband, Prince Albert, and corresponded extensively with the German mathematician Carl Friedrich Gauss, the English physicist Michael Faraday, and the German naturalist Alexander von Humboldt. In recognition of his scientific work, Quetelet was elected a fellow of several prestigious foreign institutions. Although Adolphe Quetelet played a major role in many disciplines, his greatest contribution was in the field of statistics. He is one of those who made statistics a science. Károly Keleti clearly attributed to him the creation and dissemination of the idea of modern statistics. At the start of the 2006-2007 academic year, the new lobby of the Faculty of Economics and Business at the University of Ghent was named after Adolphe Quetelet, and a large meeting room at Eurostat in Luxembourg is named after him.

2. The scientific work of Quetelet

2.1. State Descriptive Statistics versus Political Arithmetic

By the 17th and 18th centuries, two trends in statistics had emerged: state descriptive statistics and political arithmetic. Contemporary professional literature used the term 'political' to mean information on the general development and state of society, the state or the economy, rather than the narrowed sense in which it is used today. Descriptive statistics was typically German, while political arithmetic was an Anglo-Saxon trend. The German school emerged from the work of Hermann Conring (1606-1681) and Gottfried Achenwall (1719-1772) as an indispensable body of knowledge for the practice of government. This trend made the description of the condition of the state its main task. Its representatives were concerned with the consistent systematisation of facts, in contrast to the English trend, political arithmetic, which traditionally emphasised the measurement of phenomena. Whereas the descriptive statisticians made little use of data or figures in their analyses, the political arithmeticians concentrated on the observation of socio-economic phenomena that could be quantified. Political arithmetic was an extension to the social sciences of a new approach which had already taken root in the natural sciences. (Bekker, 2011) The theory and methodology of political arithmetic was most influenced by the development of the calculation of probability and the formulation of the law of large numbers. For the representatives of this science, descriptions of the state and the population were not sufficient, but they began to

investigate the causes that affect the material, spiritual, moral and religious relations of the members of society. They were looking for regularities similar to those of natural science, those that influence human actions. Social phenomena were not only described in quantitative terms, but also explained in terms of data and causal links were sought. Statistical activity has moved from a qualitative to a quantitative approach and measurement has become a central element of scientific research. The creators of political arithmetic, John Graunt (1620-1674) and Sir William Petty (1623-1687), were primarily concerned with questions of population movements.

In the 19th century, Adolphe Quetelet, who was primarily interested in political arithmetic, united the two schools of statistics. Until the 19th century, statistical activity was characterised by a predominance of enumerative methods. The most popular method was censuses, including not only censuses of the population, but also censuses of agricultural, commercial and other business enterprises. In the United States and German territories, sampling-based procedures were essentially banished from official statistics during this period. (Desrosicres, 1997)

2.2. The creation of modern statistics

The change in approach to official statistics from the 1930s onwards is undoubtedly due to the scientific work of Adolphe Quetelet, who was the first to successfully reconcile the tasks of statistical officials and scientific researchers. Thus, the era of the creation of official statistical bodies was also an era of unity between practical statistical activity and its theory and methodology. The Belgian polymath was also influenced by German academic descriptive statistics, the theory describing the current status of the state apparatus, but he also recognised the potential of statistics, the mass of data that is essential for the development of society. Quetelet believed that without the availability of reliable, large-scale data covering the relevant areas of society, modern statistical activity cannot be successfully carried out.

During his studies in Paris, Quetelet became familiar with the theoretical foundations of probability theory, and with this knowledge, he successfully introduced into official statistics methods originally used only in the natural sciences, such as averages and distributions based on systematic observations. These procedures enabled him to project into the future the laws observed in the past. In his 1835 work 'Sur l'homme et le développement de ses facultés, ou Essai de physique sociale', Quetelet outlined the programme of social physics and described his theory of the 'average man', which he characterised by the average of measured variables following a normal distribution. With Quetelet's work of 1835, a new era of statistics began. On the methodological side, he formulated two key principles. The first is that "Causes are proportional to the effects they produce". The second principle Quetelet developed was that large numbers are needed to draw any reliable conclusion. Quetelet's scientific work had an impact in various fields of social sciences. The roots of demography, sociology, criminology, biostatistics and many economic insights can be traced back to Quetelet's ideas (Desrosicres, 1997).



Figure 1: First edition of Quetelet's major work

Source: <https://www.iberlibro.com/primer-edicion/IHomme-D%C3%A9veloppement-Facult%C3%A9s-Essai-Physique-sociale/30473596128/bd>

Quetelet thus not only assigned to statistics the task of aggregating and communicating data, but also recognised a much more important role. He saw statistics as a tool for the development of the state and society. He believed that by using long time-series data, statistics could provide a picture of the economic, social and cultural characteristics of a country, and that it could be used to draw appropriate conclusions and take appropriate action on the basis of the information available (Horváth, 2021)

Quetelet used statistical correlations as a model for meteorological forecasts, the results of which he used to "explain phenomena and warn individuals and governments what will happen as a result of the observations presented, and what they must do to change events, which have the appearance of strict regularity, for the benefit of society by means of reasonable measures" (Keleti, 1875, p.11).

3. International Statistical Congresses - Harmonisation of national statistics

In the first half of the 19th century, most European countries set up their own national statistical offices. The institutional form of the statistical services varied from state to state, but they had in common that the primary purpose of using the data collected was to measure the economic and social potential of the nation.

Statistics, after its institutionalization in the 19th century, became a widely accepted science, the main representatives of which were the newly established statistical offices and organizations of the countries, which collected, systematized, analyzed and published data on the functioning of the state and society. (Horváth, 2021)

In statistics, Quetelet, as was already common in the natural sciences, placed great emphasis on the issue of standardising methods of data collection and tabulation, and the presentation of results. The growing amount of data raised the need for international cooperation, standardisation of research methods and international comparability of data. Quetelet recognised the need to promote the development of an international movement of statistical activity, the creation of comparable statistics and the standardisation of data collection, data processing and the system of indicators.

At the Great Exhibition of London in 1851, Adolphe Quetelet, in consultation with a small group of experts from various countries, developed the idea of international statistical congresses. In recognising the merits of the inventors of these congresses, it is important to bear in mind that in the early 1850s the phenomenon of international congresses was still relatively new in the world. The few international congresses held during this period were mainly concerned with problems that threatened the whole world, such as the first sanitary congress held in Paris in 1851, which was convened to control and treat cholera epidemics.

The first International Statistical Congress took place in Brussels in 1853, with 26 countries in attendance. At the first session of the Congress, Quetelet was elected president and dedicated his opening speech to the importance of uniform procedures and terminology for official statistical publications.

Between 1853 and 1876, nine International Statistical Congresses were held in different European capitals. Quetelet saw the International Statistical Congresses as events that allowed the synthesis of the experiences of the various national statistical services. In all, more than 4000 participants attended the nine congresses. In addition to European countries, statisticians from the United States of America, North Africa (e.g. Ottoman Egypt) and Turkey attended the conferences. The congresses contributed to the development of the official statistical services of each nation, to the development of dialogues between statisticians and effectively improved the international comparability of statistical data.

The debates at the conferences also helped to promote Quetelet's view that within the field of statistics, the schools of public administration and mathematics cannot be separated, as the two fields are interdependent and can only be developed together (Raderaad N., 2011)

Table 1: Highlights of the International Statistical Congresses

SN	Place	Time	Number of participants (people)		
			Domestic	Foreign	Total
I.	Brussels	19-22 September 1853	88	65	153
II.	Paris	10-15 September 1855	203	108	311
III.	Vienna	31 August - 5 September 1857	464	78	542
IV.	London	16-21 July 1860	505	81	586
V.	Berlin	4-12 September 1863	350	127	477
VI.	Florence	29 September - October 1867	666	85	751
VII.	The Hague	6-11 September 1869	372	116	488
VIII.	Saint Petersburg	22-29 August 1872	511	125	636
IX.	Budapest	29 August – 11 September 1876	267	175	442

Source: Rózsa, 2017 3. o.

At each conference, there was the opportunity to listen to presentations and engage in scientific discussions in sections covering different topics.

Public health issues have been among the key themes of the congresses. Several resolutions were adopted on health issues such as traffic and industrial accidents, epidemics and hospital statistics. Already at the first International Statistical Congress, William Farr of England and Marc d'Espine of Genoa were asked to draw up a standard classification of deaths that could be used internationally. At the next congress in Paris in 1855, Farr and d'Espine presented two separate compilations based on very different principles. Farr's classification included five groups and distinguished between general diseases and diseases localised to a particular organ or anatomical area. D'Espine classified diseases according to their nature. Congress adopted a compromise list of 139 headings, which has been revised regularly throughout history. Despite repeated revisions, the current structure of the International Classification of Diseases (BNO) is based on William Farr's proposal (Endrei D., 2016).

At the Congress of The Hague in 1869, a groundbreaking decision was taken on the need for comparative international statistics. Twenty-four major topics were entrusted to the various agencies.

By the end of the 1870s, the system of International Statistical Congresses was in crisis, partly because of the growing nationalism in Europe and partly because of Franco-German political antagonism. However, during the 25 years of the International Statistical Congresses, the profession had fully embraced Quetelet's original idea of the need for an international organisation to coordinate the work and cooperation of the national statistical offices. In 1885, a decade and a half after the last International Statistical Congress, the International Statistical Institute (later abbreviated to ISI), the largest and most prestigious institution in statistics, was founded to continue the work of the Congresses and continues to play an active role

in the development of international statistical guidelines, the professional development of statisticians and the dissemination of good practice.

4. The creator of crime statistics

Justice statistics, and crime statistics in particular, developed relatively late, only in the 19th century. The reason for this is to be found in the feudal system and the lack of a criminal justice system, since crime statistics can only be compiled if there are criminal codes that define the offences and if there is a modern judicial organisation and procedures.

We first encountered criminal statistics in France. In the late 18th and early 19th centuries, the Intendant, appointed by the monarch, reported annually on the number of deaths and other serious crimes by type of crime. In the early 19th century, conviction and prison data began to be collected in many other European countries, such as Bavaria, Prussia, England and the Austro-Hungarian Monarchy. The emperors wanted to quantify and record criminal justice as a state activity. Over the years, these conviction and enforcement data were gradually expanded to include personal data on offenders. Over time, more and more aspects of both the offender and the offence side were analysed, which allowed the study of crime as a mass phenomenon in society. From 1826 onwards, annual crime statistics reports were produced by the French Minister of Justice (Balázs J., 1968).

The database of more than a million convict records enabled Adolphe Quetelet to create a morality statistic. Quetelet's major work, based on French crime statistics for the years 1826-1830, used the methodology of probability to identify trends that gave a completely new dimension to the way society had been understood up to that time. Observing the recurrent regularity of the crime figures from year to year, he established the social necessity of crime, which he expressed in his famous and much-debated saying: 'There is a tax which the people pay with frightful regularity, and that is the tax of prisons, galley raids and blood banks, which we should strive to reduce.' 'We can predict how many people will soil their hands with the blood of their fellow human beings, how many will be counterfeiters, how many will be poisoners'. In his search for the laws that govern the moral world of mankind, he came to the conclusion that man is under the coercive influence of laws in society. Human action is determined by human capacity, degree of education, wealth, existing institutions and a myriad of other random factors that are hardly detectable. Quetelet divided the explanatory variables into two broad groups. One group consisted of permanent causes, or natural factors, and the other of random causes, by which he meant individual moral, intellectual and volitional influences. He found that some citizens were more likely to commit crimes than others, especially those who were underage, male, poor, unemployed and undereducated (Hoóz 1996). Quetelet focused his attention not only on crime, but also on all the phenomena he believed determined the moral face of society. He also studied the evolution of suicide, divorce, out-of-wedlock births and prostitution.

Quetelet recognised that it was possible to improve the state of human societies through appropriate state intervention, but that this required an understanding of the interplay of social processes.

The International Statistical Congresses have promoted the development of national crime statistics through the dissemination of improved statistical methods and have

achieved considerable standardisation in the field of crime statistics. The Paris Congress of 1855 and the Budapest Congress of 1876 dealt with the issues of criminal statistics (Hoóz 1996).

5. Summary

Adolphe Quetelet opened a new era in the development of statistics. He gave statistics new goals and new tools to achieve them. His conviction that the scientific study of social life should be based on quantitative methods and mathematical techniques foreshadowed, as early as the mid-nineteenth century, the concept that has become the guiding principle of modern social research. The statistical methods that he pioneered and which he promoted in international scientific circles are as important and inescapable today as they were in his day.

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LABOUR MARKET IN A TIME OF CRISIS. WHAT DO HR EXPERTS SAY ABOUT THE IMPORTANCE OF DIGITALIZATION IN THE POSTPANDEMIC CONTEXT

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Abstract: For several years we are facing the Fourth Industrial Revolution, or Industry 4.0 as it is also called, which puts its mark across every aspect of our societies. The job market is probably the sector which mostly has to defy the challenges imposed by new technologies and digitalization. Moreover, the COVID-19 pandemic majorely impacted the world and, implicitly, the work and the labour market. In order to keep their jobs safe, in a post-pandemic digitalized world people need to focus more and more on developing 21st century skills. The present paper presents an image of a digitalized labor market before and after COVID-19 pandemic, and focuses on how new technologies, which are more and more integrated into the labor market, affect jobs and force people to shift their attention over again to the development of new skills and competences. Qualitative research data was collected from HR experts in private companies from Oradea. We aim to outline the changes ocured on the labour market before and after COVID-19 pandemic with focus on the digitalization of work. We investigate how much emphasis companies put on digitalizing the work, which are the new skills that managers are interested in for their employees, and also what is the strategy managers follow in order to train a highly qualified human resource for a digitalized world. Our results show that there are significant changes on the labor market due to digitization which has accelerated after COVID-19 pandemic, however the changes depend on the field of activity. Companies needed to adapt to the new post-COVID-19 context on the labor market and they restructured their way of organizing their work: technical unemployment, short work schedule, flexible work schedule, remote work. Employers are increasingly looking for candidates who have a good level of training in terms of their digital skills and the candidates themselves are more open to different forms of activities in the digital sphere. The technological evolution which defines the features of Industry 4.0 cannot and should not be stopped while the future of our society encompasses digital and technological development in a higher extent.

Keywords: Industry 4.0; digitalization of work; COVID-19 pandemic; digital skills; human resources

JEL Classification: M51, M52, M54, A23

1. Theoretical insights

1.1. The 4th industrial revolution

Currently we are crossing a revolutionary period, namely the 4th industrial revolution: artificial intelligence, automation, mobile supercomputing, intelligent robots, self-driving cars, robotics, the internet of things, 3-d printing, nanotechnology, biotechnology, neuro-technological brain enhancements, genetic editing.

The term of Industrial revolution 4.0 was first used by Klaus Schwab (2015), founder and executive chairman of the World Economic Forum, when referring to the extremely complex transformations that humanity will witness, changes that will have a major impact on every production, management and governance system. Schwab (2015) said that this revolution will change “the way we live, work, and relate to one another”.

In this context, older professions are lost and new jobs emerge. The 2016 Future of Jobs Report argued that “perhaps 60% of children entering primary school today might ultimately work in job types that currently don’t exist.” (World Economic Forum, 2016). Therefore, questions like *Are employers and employees prepared for this new digital world?* are raised. Is there a shift in what skills people will need in order to increase their chances of integration on the labor market? Moreover, we need to address more closely these type of questions especially as we are now in the post-pandemic context.

According to the latest Future Job report in 2020 (World Economic Forum, 2020), 84% of employers are set to digitalize their working processes (including remote work), 43% of them will reduce their workforce due to technology integration, therefore by 2025, humans and machines will spend equal work time. This will lead to a new division of labour between humans and technologies. Well-being challenges will emerge as social inequality is estimated to increase both by the post-pandemic effects and impact of new technologies.

The European Union is aware of the challenges posed by the digital transformations that societies are going through. The targets set out in the 2030 Digital Compass (European Commission, 2023) include 4 main points: a digitally literate population and highly skilled digital professionals, secure and sustainable digital infrastructures, the digital transformation of enterprises and digitization of public services. Till 2030, European Union must reach 80% of adults with at least basic digital skills, 20 million ICT specialists employed, 75% companies using cloud computing, AI and Big Data, over 90% of SMEs with at least basic level of digital intensity, the provision of essential public services 100% accessible online, 100 % of citizens with access to their electronic health records and 100 of citizens with access to secure electronic identification (European Parliament and Council, 2022). One of the mechanisms used to measure the progress towards each of the 2030 targets is the Digital Economy and Society Index (DESI).

The latest DESI report (Digital Economy and Society Index, 2022) ranks Romania on the 27th position of the 27 EU Member States. This position is explained by a very low level of basic digital skills compared to the EU average and poor integration of digital technologies and digital public services for businesses and citizens. The shortcomings encountered by Romania in the digitization process explains an

economic situation in which the opportunities offered by new digital technologies are not taken advantage of. However, Romania scores best at connectivity, surpassing the EU average. Only 28% of individuals in Romania (compared to 54% at EU level) have at least basic digital skills (eg.: ability to explain information needs; locate, retrieve, store and manage digital data, content and information, or to assess the relevance of the source and the validity of its content).

1.2. The process of digitalization and rethinking the digital skills

For many years now, the public sphere of debate brings together experts, stakeholders, policy makers who raise the issue of the changes that the labor market will face under the conditions of the transition to the digital age. One of the main concerns refers to the job displacements in the context of automation and skills gap. Workers are also concerned about what the future might bring and the possibility to lose their jobs. 40% of EU workers consider that they may lose their job and half of them think that the digital technologies are causing it (Cedefop, 2022). The digital decade is translated into a skills transition. To increase their employability, people need to develop or upgrade their digital skills. Digital skill gaps are encountered mostly in the case of workers that use only basic digital technology and those with low levels of education, and these gaps place them in a risk situation regarding unemployment, low productivity and low career opportunities. In order to overcome all challenges imposed by a digital world, a strategic approach is needed where governments, business and people work together.

In this new light, the labour market needs to rethink the digital competences by reskilling and upskilling. Employers estimate that around 40% of workers will need reskilling for about six months and 94% of them expect that their employees will learn a new skill. By 2025, employers estimate that they will offer for about 70% of their workers reskilling and upskilling programs. However, only 42% of employees take advantage of such training opportunities. Technological automation and augmentation will not necessarily assume layoffs, rather internal redeployment (World Economic Forum, 2020).

The COVID-19 pandemic had a major impact on the labor market. In 2020-2021, almost half of workers witnessed the introduction of a new digital technology at their job and 35% of them had to learn how to use it (Cedefop, 2022). However, the digitalization process mostly implies reskilling and upskilling, than job displacement. This will lead to an increase of job quality. Yet, even if 45% of workers consider they need more training in order to work with new digital technology, only one in four actually participated in such training in 2020-2021. People must take advantage of the advantages of digital technology, not fear that they will be replaced by it. It is more a collaboration than a threat.

According to the Digital Competence Framework (Council Recommendation on Key Competences for Lifelong Learning, 22 May 2018, ST 9009 2018 INIT, apud. Vuorikari, Kluzer and Punie, 2022), "digital competence involves the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and

critical thinking". The DigiComp 2.0 framework includes 21 competences structured in 5 areas.

By 2025, the top skills required on the labour market will include critical thinking and analysis, problem-solving, skills in self-management (active learning, resilience, stress tolerance and flexibility). Personal development courses are also emphasized by employers and those are unemployed tend to focus on learning new digital skills (data analysis, computer science and information technology (World Economic Forum, 2020).

1.3. Pandemic impact on HRM and digitalization

The Industry 4.0 has brought to front many challenges across different fields of activity, and also strongly impacted the way human resources is organized. A systematic review of literature highlighted four dimensions of these changes: HR Digitalization, HR Management, HR Strategy and HR Competencies (da Silva et al., 2022). Digitalization, as the first category in new trends in HRM, focuses on the use of new technologies in recruiting and training, new ways of working, people analytics, automation, use of AI and machine learning, big data and virtual reality, as well as the human-robot collaboration.

The COVID-19 pandemic has brought significant challenges to human resource management (HRM) and has impacted how people are employed, managed and developed in organizations (Hamouche, 2021). The pandemic has generated significant challenges for managers and HRM practitioners.

Though controversies arised regarding the restrictions imposed, most businesses were seriously influenced by these (Borma, 2023). During the pandemic many enterprises (temporarily) closed their activity, used remote work, reorganized the work space to ensure distancing, organized online meeting instead of face-to-face. Some of the changes implemented were kept even after the restrictions were raised. Remote work and work from home have become more common (Hamouche, 2021). The main challenge faced by human resources managers was to lead from a distance, maintaining a motivated team under a stressful and uncertain context (Caliguri et al., 2020). Advantages of working from distance include transparency of decision by creating electronic trails, attenuate cultural differences and language misunderstandings also due to documentation used in online meetings, and also reduce the time needed for traveling to meetings when geographically people are from different areas (O'Leary, Wilson, & Metiu, 2014), flexibility and autonomy of work (Gunter, Hauff and Gubinator, 2022). These elements are mostly relevant for international teams, especially involved in collaborative work and decision making (Maznevski and Chudoba, 2020). Teams that manage to meet regularly, even online, and have shared a professional identity can overcome geographical and even cultural distance. However, teams that were not accustomed to work online, who did not create strong working relationships and did not develop a clear organizational culture, faced greater challenges imposed by the pandemic (Caliguri et al., 2020).

The challenge to organize the distanced work and keep the work satisfaction, motivation and general wellbeing was addressed differently across sectors. As Gunter, Hauff and Gubinator showed in research on German context, a high impact on teleworker wellbeing was from interest of HRM managers on health care-oriented leadership and practices. Ensuring continuous information regarding the most

probable changes in the work place proved beneficial for morale of employees, and such practices should be kept also in the case of remote work environments. The use of digital technologies in HRM started before the pandemic context, as the use of AI in recruiting, the online selection and training, use of IT technology in training (Lumi, 2020). The changes in the workplace imposed by the Covid 19 restrictions accelerated the adoption of such practices even more. The aim of our study is to investigate this phenomenon on the local labor market.

2. Research study regarding the digitalization process in the postpandemic context. Perspectives from HR experts

2.1. Methodology

The present study aims to reveal the main impact of the process of digitalization on the labour market before and after COVID-19 pandemic. We present an image of a digitalized labor market, with focus on changes that occurred in the pandemic context.

The main research objectives addressed are the following:

1. Identifying how much emphasis companies put on digitalizing their work;
2. Identifying which are the new skills that managers are interested in a job candidate;
3. Identifying the strategies managers follow in order to train a highly qualified human resource for a digitalized world,
4. Identify the impact of changes generated by the pandemic regarding the digitization of work.

Our study has a descriptive-explorative approach, following a qualitative research methodology. In order to have a comparative perspective regarding the period before and after the pandemic, we used a methodological mix, collecting data in two stages. In a first research phase we organized a focus group in which 6 HR experts were involved. The focus-group was held in 2018. This part can be seen as a pilot study, as in the context in which afterwards the labor market was affected by the pandemic, we wanted to resume our research in order to capture the main changes regarding the digitalization process in this period. In the second part of the research, we conducted 10 deep-interviews with HR experts. The data was collected between April and May 2023.

In the first phase of our research, we choose to use a focus-group because by giving all participants the opportunity to interact, it enables a group debate on topics of common interest. The focus group guide was structured on 3 dimensions: D1. Current situation on the labor market; D2. Use of new technologies in a digitalized labor market and new skills and competences for a digitalized labor market and D3. Future HR management strategies. For the interviews conducted in 2023, we kept the initial dimensions to which we added a new dimension related to the impact that pandemic had on the digitization process. We chose this type of individual interviews to allow the subjects to elaborate on each topic in the discussion and to be able to capture all relevant details (Babbie, 2010). The data were processed using thematic analysis, emphasizing the comparative perspective of the results.

2.2. Participants

At the focus-group held in 2018, 6 HR specialists from companies in Oradea participated: 1 recruitment agency, 1 sales company, 1 transport company, 2 service companies, 1 hotel company. Most participants were female, with 5 to over 15 years of experience in the field. The interviews conducted in 2023 included 10 HR experts from the private sector, most of them women, with the seniority in the organization between 2 and over 20 years.

3. Results and discussions

The answers given by focus group participants in 2018 were interpreted based on the thematic analysis, and the research results are presented in what follows taking into consideration each dimension of the focus group guide. For each dimension, the section contains the presentation from a comparative perspective of the data obtained during the interviews conducted in 2023. Also, we presented the data obtained for the fourth dimension regarding the impact of COVID-19 pandemic, in 2023.

D1. Current situation on the labor market

For some years the labor market is subjected to various changes especially in what regards its dynamic. These changes represent real challenges both for employers and employees.

If in the previous years the employers' difficulties were mainly related to the selection of the most suitable employee for a specific job from the multitude of candidates, nowadays, HR specialists face many problems mainly due to lack of staff or poor staff training in all areas. In 2018 HR specialists confirmed that they are facing lack of labor force and outlined the fact that this is an ascendant trend on the labor market. Also, they pointed out to lack of qualifications mainly due to the absence of craft schools in Romania.

Quote from HR expert in 2018: *"First, the lack of labor force and this can be confirmed by HR colleagues from companies with many employees. It is actually a problem that I have personally observed, it is my opinion - the lack of qualifications..., there are no craft schools anymore..."*

Employers tended to lower their employment standards (skills & competencies), especially for unqualified jobs:

Quotes from HR experts in 2018: *"Because we face a labor force deficit, candidates' competencies no longer matter. Employment standards are lower than they were about 10 years ago, when candidates were queuing for a job. Nowadays, the candidate needs to have two legs and arms, and to know how to speak"; "The level of required skills and competences is lowering. If they find candidates, employers are happy ... the rest (their training and competence development) is managed directly by the company (mentorship, teambuilding, trainings ... including foreign language courses)."*

Moreover, participants outlined a labor force deficit due to a massive emigration.

Quote from HR expert in 2018: *"In 2008-2009 we had many CVs waiting in the line...But, the best candidates emigrated and now there are only elderly and children left."*

An important aspect highlighted in the interview was related to the beginning of the career in case of young people. Focus group participants state that young people start their career at the age of 28-30 years. They believe that young people are not responsible until that age and are not motivated to work, this behavior being encouraged also by their parents who provide them financial and material support. The discussion developed towards parents' responsibility in educating their children, and the models they promote are focusing on the fact that school and work are not valorized by the present society.

Quote from HR expert in 2018: *"...Another problem, the young people; statistically speaking, in Romania, the career of a young individual begins between 28 and 30 years old. Only then he/she is able, I do not say everyone, but most of them, to detach from the family, to be independent, responsible and to do something... Only after that age young people think what they want to do with their life. Until then they do nothing, and the parents are the greatest accomplices because they keep them at home and accept them to use the technology, we have at our disposal to lose time in fact, and not using it effectively..."*

Another problem identified by HR specialists in 2018 was the unrealistic expectations of the candidates. For them, their training or knowledge and skills are not important, because they are mostly interested in high incomes.

Quote from HR expert in 2018: *"Candidates have great expectations ... they only want well-paid jobs."*

Compared to the aspects identified by HR experts in 2018, interviews in 2023 still highlight the deficit on the current labor market, and an acute imbalance between demand and supply. This situation is created not only by the difficulty faced by employers to find the right workforce, but also by the strive to keep the human resource in the company, a fact outlined by the competition between companies to have employees. A possible solution identified by the subjects to reduce this deficit is to recruit labor force from non-EU countries, especially from Asia.

Quotes from HR experts in 2023: *"The main imbalance is the acute lack of labor force. This lack leads to labor migration from one company to another."*; *"The retention of existing staff in the organizational chart became an important objective."*; *"Candidates are the ones who dictate the labor market now, companies are fighting for fewer and more expensive specialists."*; *"There is no balance between demand and supply neither for unqualified workers, where the work force from Asia is called upon more and more, nor for those of specialists because the Romanian schools are adapted to the needs of the labor market."*

The deficit between demand and supply is due to the way in which the connection between the educational system and the labor market needs is ensured. Currently in Romania there is a lack of qualified personnel in technical fields, a lack of digital or communication skills, a lack of qualification of young people in a certain field and a lack of interest of youngsters to be present on the labor market. More, the socio-economic context results in a massive migration to Western countries. The labor force deficit is also explained by the regional disparities in the country regarding wages as well as job opportunities.

Quotes from HR experts in 2023: *"There are imbalances between the training, the level of the candidates and the employers' expectations."*; *"...the lack of interest manifested by the young generation for a stable and long-term job..."*

In 2023 subjects noted that, because of the pandemics, certain sectors of activity suffered more compared to others. The main changes refer to the working time, especially a more flexible work schedule, and online collaboration. The staff recruitment process is more efficient due to online meetings and interviews.

Quotes from HR experts in 2023: *"While the COVID-19 pandemic has been devastating for some industries, such as hospitality and entertainment, it has been extremely beneficial for others, including the IT industry."*; *"Today, many employers are realizing that virtual recruitment is not only more efficient, it's the future. Online job interviews or interviews that include a virtual element save time and money for employers and candidates and provide a fast and efficient hiring process."*

D2. Use of new technologies in a digitalized labor market and new skills and competences for a digitalized labor market

HR expert participating at the focus group in 2018 stated that there is a high emphasis on new technologies, but their implementation in the working field depends on the specificity of each job. The extent to which companies implemented new technologies is rather low and does not raise the risk of unemployment.

Quotes from HR experts in 2018: *"We try to keep all our employees, because we face a crisis of labor force"*; *"New technologies should be more and more implemented within the labor market, because they can increase the profit, but they are related to the job profile"*.

Respondents stated that new technologies make work more efficient, increase profit, and the risk of unemployment or dismissing employees once these technologies are implemented on the labor market is non-existent, due to labor force deficit, on one hand, and on the other hand because *"However, behind these technologies we find people, because the human resource is indispensable. People are still needed, but fewer."*

In what regards the skills of future employees, they are closely related to the targeted job. Poor employment requirements apply especially to positions involving unskilled work or various types of occupations. For middle and top management positions employers require soft skills such as: communication ability, employee motivation, problem solving, creativity, and macro-management knowledge. Even for entry level positions the orientation towards results (to solve some situations) and sociability are required.

Quote from HR expert in 2018: *"For qualified jobs, they need to have leadership, macro management and communication skills. For entry levels, the candidate must be oriented towards results and sociability"*.

Digital skills are also very important. In general, digital competences are assessed during the employment process, but further, companies tend to provide digital training to their employees because many of them have poor digital skills.

Quote from HR expert in 2018: *"Digital competencies are important. But, in the present context, we are happy if the candidate knows how to read and write properly"*.

There are companies that focus on employees' training, have annual development plans, have long-term investments in order to identify competent employees, "talents" and develop their skills. Also, these companies offer training for developing all soft, technical and linguistic skills, and *"employees are paid during this period,*

only than they produce". Obviously, there are some risks. HR experts mentioned the risk of leaving the job immediately after the training, which leads to considerable losses for employers.

A problem identified by HR specialists in 2018 starts from the formal education and implies poor use of technologies and low level of digital skills. They believe that schools and universities do not have resources (infrastructure) to properly ensure the transfer of digital competences. Moreover, focus group participants consider that poor digital skills emerge also because the educational system has low quality.

Quote from HR expert in 2018: *"Nowadays, a higher education diploma doesn't mean the candidate has also good competencies and skills"*.

Compared with the main aspects highlighted by HR experts in 2018, specialists who participated at the interviews in 2023 put more emphasis on the increasingly acute need for soft skills, arguing that the technical training specific to a certain field can be covered by qualification at the workplace. As in 2018, also in 2023 HR specialists state that technical competencies can be achieved and developed directly at the working place. Soft skills that are looked for by employers remained almost the same. The suitable employee is the one who understands his or her role in the organization and adapts to its culture and values.

Quotes from HR experts in 2023: *"4-5 years ago professional skills were very important and personal skills (hard skills vs soft skills) were less "rated". Technical skills are tangible, measurable, specific to each field, can be learned and developed with experience, and are absolutely necessary for work. Soft skills ensure a positive work environment, a pleasant atmosphere and a framework of psychological safety. Communication, the ability to adapt, motivation, the ability to analyze (criticize) and make decisions, teamwork, proactivity, the willingness to learn new technologies, creativity, persuasion and emotional intelligence are a set of skills that recruiters have in mind when evaluating candidates for their companies."*; *"...adaptability is the most important competence we look for in a candidate."*

New technologies and work tools will be introduced at the workplace and reshape the work space, while employees will have to learn to use them. Digital skills among employees are increasingly in demand. Working in a digitized work environment is not seen as a threat, but people must learn to adapt to new technologies and use the advantages offered by them. This adaptation to new technologies involves upskilling and re-skilling.

Quotes from HR experts in 2023: *"The evolution of technology will also be accelerated by the growing need for new systems and tools in order to have workspaces better adapted to the future."*; *"...it depends very much on each individual to embrace these new opportunities at the expense of the "blockage" caused by the apparent inability to adapt to new technologies."*

The advantages of using new technologies on the labor market are evidenced especially by the fact that ICT are implemented more on the technical side, on repetitive work requirements, while employees can put more emphasis on developing their soft skills. HR experts in 2023 also mention certain disadvantages of using new technologies in terms of their dependence on electricity or Internet, respectively problems related to online data protection, vulnerability to cyber attacks. Quotes from HR experts in 2023: *"As machines take over some repetitive and routine tasks, employers are increasingly looking for employees who can perform complex*

tasks that require critical and analytical thinking, such as decision-making and problem-solving... ”; “Employers are looking for employees who are willing to learn and adapt to new technologies and changes in the industry.. ”

The same as in 2018, HR experts in 2023 highlight the importance and necessity of the human factor on the labour market, independently of the use of new technologies.

Quote from HR expert in 2023: *“On the one hand, there is the fear that digitalization will lead to the disappearance of classic jobs, but on the other hand, other jobs will certainly emerge. However, no matter how intelligent new technologies are, there are areas where the human factor is more than necessary, where the new technologies do not have the ability to interpret situations and make decisions.”*

D3. Future HR management strategies

In 2018 HR specialists highlighted the following strategies for finding and keeping human resources within the company: part-time jobs especially for mothers; more flexibility to employees, such as arriving later at the job, leaving earlier on Fridays, various trainings for their new employees; investment in vocational schools to properly train the labor force.

Quote from HR expert in 2018: *“We train the new employee... digital competencies, language courses, mentorships, team buildings”.*

A massive digitalization and automatization of work is considered only as a long-term strategy for companies.

Quote from HR expert in 2018: *“Yes, we can say that our company takes into account a more digitalized work, but somewhere in the future... I don’t know in how many years...”*

However, for now, the strategy is to import labor force from non-EU countries for unskilled jobs, but not only (eg: drivers). In 2018 companies import labor force from countries such as Serbia, Macedonia, Georgia, Moldova, Turkey, Armenia.

Quote from HR expert in 2018: *“We are recruiting candidates also from non-EU countries like Turkey, Georgia, Ukraine, especially for low qualified jobs”.*

As a response to labor force deficit, a long-term strategy is to reduce the number of jobs by digitalizing the work and introducing new technologies.

Quote from HR expert in 2018: *“If you don’t have people, than you’d rather invest in technology”.*

Important investments in technology are estimated by specialists because this can increase profit; however, technology investments need to be adapted to company profile.

In 2023, the main strategy remains unchanged in terms of identifying and retaining employees, namely investing in several types of training programs, structured according to the educational and professional features of different categories of employees. Usually, professional training takes place internally, within the company, but substantial funds are also allocated for external trainings, for example online programs.

Quotes from HR experts in 2023: *“The company encourages continuous learning by covering the expenses for the certifications that employees obtain.”; “The focus on training has increased, we have organized courses for computer use, low and*

medium training for employees, English language courses, Excel and soft skills courses (leadership, project management, multiculturalism)."

Data in 2023 indicate three main directions on which the training of employees is structured: development of technical skills relevant on the field of activity, training of digital skills, English language courses, and development of soft skills such as communication, team work, project management, time and stress management, leadership.

Quote from HR expert in 2023: *"...the employees work, as well as on the development of soft skills, such as: stress management, time management, communication and relationships, teamwork and others."*

The respondents in 2023 emphasize a continuous dynamic on the labor market, which has intensified in recent years also because of the Covid-19 pandemic, a process that cannot be ignored and which will continue to bring major changes in the way labor market is structuralized and organized. The emergence of new jobs will lead to changes in professional requirements and the need for specific skills. Also, remote work is considered to be a definitory characteristic of the future labor market. Quotes from HR experts in 2023: *"In general, the labor market is increasingly dynamic and volatile, and employers must be prepared to adapt to rapid changes, and invest in the development of employees' skills to remain competitive."*; *"The events of recent years have shown us that the world around us and our lives can change very quickly. Technology is developing strongly, and in 5 years everything may be very different from what it is now. But we will definitely need more employees, who will probably learn new things."*

Digitization, automation, artificial intelligence are the main factors identified by HR experts in 2023 that will play an important role in structuring future jobs. Many new jobs will appear in the IT, technological and digital sectors. As examples of future jobs, the subjects mention: specialists in protection of user data, digital marketing, digital human resources expert, software development specialist, artificial intelligence specialist, smart home designer, automation in production etc.

Quote from HR expert in 2023: *"The trend is clear, digitization, automation and more recently Artificial Intelligence will have an important role in the configuration of future jobs and job description."*

The massive presence of digitization in professional activity compels the labor market, employers and employees alike, to adapt to changes and challenges, to be flexible and open to new trends. HR experts in 2023, unlike the ones in 2018, notice that a more emphasis will be placed on the sustainable nature of professional activities and the implementation of green technologies, which will also lead to the emergence of new jobs in this field, and to the adaptation and accessibility of working environments.

Quotes from HR experts in 2023: *"...there is an raising interest in sustainability and green technologies, which could lead to an increase in jobs in these fields."*; *"The evolution of technology will also be accelerated by the growing need for new systems and tools in order to have work spaces which are better adapted to the future."*

D4. The impact of COVID-19 pandemic on digitalization and the development of digital skills

Subjects interviewed in 2023 highlighted the massive emphasis that has been placed and will continue to be placed on the use of new technologies in professional activities; their use is gradually becoming a common practice.

Quote from HR expert in 2023: *"...the COVID-19 pandemic has accelerated the process of digitization of work and the implementation and use of new technologies in many fields. As the pandemic has led to severe restrictions on social interactions and mobility, many companies and organizations have had to adapt quickly and find alternative solutions to maintain their activities and communicate with their employees and customers."*

In the case of many companies, the pandemic has determined the acceleration of the digitization process and the change of work strategies by implementing the flexibility of work schedule, remote work, online communication and professional collaboration, the purchase of specialized software in order to optimize the activity. The way in which the activity was adapted due to technologies was a model of good practice, and is maintained by many companies even after the pandemic.

Quotes from HR experts in 2023: *"Our activity was mostly digitized even before the pandemic. The pandemic taught us to adapt to situations and if before the pandemic the level of online meetings was quite low, during the pandemic it increased a lot. And this way of having meetings and business discussions online was maintained after the pandemic."*; *"After the COVID-19 pandemic many companies have adopted remote work and become more flexible in terms of working hours. This trend will continue in the future..."*

HR specialists mentioned that the level of digital skills differs from employee to employee, the young ones being better prepared in this regard because they are more familiar with new technologies. The need for digital skills increased during the pandemic, and therefore, the emphasis was placed on staff training.

One of the challenges posed by pandemic was the need to use digital technology by all categories of employees, regardless of their level of training or age. However, HR specialists in 2023 note that employees managed to develop the necessary skills.

Quote from HR expert in 2023: *"...the need to develop digital skills has increased compared to the pre-pandemic period. And I think this is the way to follow. Everything is digitized more and more, and we will have to adapt and keep up with the times."*

Conclusions

All HR experts, both in focus group in 2018 and individual interviews in 2023, point out a labor force deficit faced by Oradea. Therefore, the focus is on finding and retaining employees, the implementation of a strategy to respond to a competitive environment in which every employer tries to attract the right human resource. In such a situation, the focus is less on the skills that the employees possess, respectively their level of training, and more on just having human resources.

HR experts refer to the main factors that explain the labor force deficit: the way in which education is not correlated with the needs of the labor market, the way in which young people relate to work and their (unrealistic) expectations regarding the workplace, and migration. In such a context where employers "struggle" to find the right employees, specific skills in the field are not that important as are the

transversal skills, the soft skills, those contributing to the adaptation of the employee to the work environment.

The impact of the pandemic in general, and on the digitization process, in particular, depends on the field of activity: some organizations felt a stronger impact and had to adapt and restructure their work, other companies did not had to change that much their work.

People are important and employers are looking for people. Both participants in 2018 and 2023, even after the pandemic context, emphasise that the human factor is the most important one on the labor market. In 2018 new technologies were seen only as a long-term strategy. After the pandemic, when the digitization process was accelerated, employers admit that the future implies the use of new technologies; nevertheless, they still consider that any strategy must keep its focus on training human resources. All the experts, in 2018 and 2023, point out that the new digital age means the disappearance of some jobs and the appearance of others, however this is not seen as a bad thing as it is a normal evolution of the society. The entire transition to the digital age presents both advantages and opportunities, as well as certain risks or vulnerabilities. The same as the literature points out, our results confirm that the next period will imply a transition of skills, including upskilling and re-skilling.

Regarding digitization, the main impact that the pandemic had was materialized in online collaboration (not necessarily online work, but online communication and collaboration), respectively the flexibility of working time (also in the context of remote work). Even if digitization was somewhat forced in the context of the pandemic, the transition was easy, and companies quickly adapted to the new ways of working.

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THE LEGAL CAPACITY OF THE PARTIES, AS A VALIDITY CONDITION FOR THE MANDATE CONTRACT

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Abstract: *This article aims to bring attention to the mandate contract, under the aspect of its validity conditions, more precisely the legal capacity required of the parties to be able to conclude such an agreement. First of all, the mandate contract must meet the general requirements for the validity of contracts, stipulated by art. 1179 para. (1) Civil Code. Regarding the form of the power of attorney, art. 1301 Civil Code specifies the fact that it will be effective only if it is given in compliance with the forms required by law ad validitatem for the conclusion of the contract that the representative is to make on behalf of the represented. In addition to these general conditions of contract validity, the conventional representation by mandate, in order to be effective, also requires the fulfillment of certain specific conditions, which essentially relate to the manifestation of the legal will of the participants in this tripartite operation, namely: the will of the representative to represent; the will of the represented to be represented; the will of the representative to perform legal acts through representation; the externalized will of the representative to represent and perform legal acts with the contracting third party and the externalized will of the third party with the value of accepting the contract with the representative (contemplatio domini). Therefore, the requirements for the valid and effective conclusion of the mandate contract must be assessed at the time of the conclusion of the convention, but in order for it to reach its final goal, consisting in the performance by the agent of the business entrusted by the principal, the requirements for the valid and effective conclusion of the targeted act, at the time of its completion, must also be met. Out of all these conditions claimed for the valid conclusion of the mandate, we have chosen to focus our attention in this study on the capacity required of the parties to contract, necessary so that conventional representation, as a tripartite operation, which involves a source act (the mandate agreement) and one/more targeted acts (the act/s concluded by the agent with third parties in the name and on behalf of the principal) will be validly formed.*

Keywords: *mandate; legal capacity; trustee; principal.*

JEL Classification: *K11; K12; K15; K22*

1.Introduction: doctrinal discussions about the validity conditions of the conventional mandate

The mandate, as an "*intuitu personae*" contract, claims for its valid conclusion the respect of both the general conditions of convention validity, provided in art. 1179 para. (1) of the Civil Code (the capacity of the parties to contract, the valid and unblemished consent, the valid object and a legal and moral cause), as well as some requirements specific to the mechanism of conventional representation, namely: (1) the existence of the power of representation; (2) the existence of the intention to represent, brought to the attention of the contracting third party; (3) manifestation of the representative's valid, free and untainted will. We also believe that for the valid performance of conventional representation, in addition to the valid, free and unblemished will of the representative, revealed as a condition by the doctrine, the same requirement must also be met in the person of the represented person, in order to empower another person to conclude a legal act whose effects are to be produced upon his person and his patrimony.

Regarding the capacity of the parties to contract, the doctrine recorded controversies generated by the question whether it is necessary or not for the representative to have full exercise capacity in order to validly conclude the legal operation for which he was empowered. First of all, there is the question of whether the trustee solely expresses the will of the principal at the conclusion of the act for which he was commissioned, or whether he also expresses his own will. Because if we believe that it only expresses the will of the principal, it will be enough that the latter has the ability to conclude the targeted act; as far as the trustee is concerned, he will only have to express a valid consent (that is to have discernment), that is also unblemished (art. 1299 Civil Code). If, on the contrary, we believe that the representative expresses his own will at the conclusion of the targeted act, then he will have to have the ability to conclude that act himself.

As far as we are concerned, we tend to believe that the trustee expresses not only the will of the principal in the execution of the power of attorney received, but also his own will. Secondly, we believe that it is necessary to differentiate between two aspects: is it necessary for the agent to have full exercise capacity to be able to validly conclude the targeted act, or he is required to only have the capacity required of the principal himself to be able to conclude the respective operation? Of course that under the conditions of explicit regulation established by the legislator in the new Civil Code, the clarification of this aspect is easy: art. 1298 Civil Code claims both the represented and the representative, "*the capacity to conclude the act for which the representation was given.*" Therefore, the capacity required of the agent will have to be related to the nature of the legal act for the conclusion of which he was authorized by the principal. As far as the principal is concerned, he must have the capacity required by law to be able to conclude the legal acts for which he instructs the trustee.

It must be emphasized that the legal regime applicable to the legal entity, in its capacity as principal, is more severe than that enjoyed by the natural person, who can be held responsible for the excessive acts of his agent only under the conditions of art. 1309 paragraph (2) Civil Code, that is, when the third party contracting in good faith can invoke against the principal the existence of an

apparent mandate. The legal person, on the other hand, in relations with third parties, *"is bound by the acts of its bodies, even if these acts exceed the power of representation conferred by the act of incorporation or statute, unless it proves that the third parties knew it at the time of conclusion of the act"* (art. 218 para. 2 Civil Code). This means that in relation to contracting third parties, the limits of the powers of representation of the bodies of the legal entity are considered to be those established by law, while those set by the principal himself (by conventional mandate) being opposable to third parties only if they are known by them. However, these legal regulations only concern the representation of the legal entity through its administrative bodies; on the other hand, the legal entity can also appoint its representatives under the conditions of common law, who will be agents subject to the provisions of the Civil Code regarding the mandate contract, so they will be able to act on behalf of their principal (that is, the legal entity represented) only within the limits of the mandate conferred to them, under the conditions of art. 2017 Civil Code.

Regarding the criteria for interpreting the limits of the powers of the trustee, two orientations have been outlined in doctrine and jurisprudence: one that supports the need for a strict and limiting interpretation of the scope of the general mandate and another that favors a more permissive interpretation of it. As far as we are concerned, we share the second orientation, as we consider that acts of disposition are not prohibited to the general trustee in an absolute manner. According to art. 2016 para. (1) Civil Code, the general trustee can only administer, but this right must be understood in its entirety. Thus, in practice, the administration of an estate involves, in addition to preservation acts, also acts of administration, as well as some acts of disposal of some of the assets of the principal, acts which, related to his patrimony as legal universality, are limited to the purpose of good administration. Also, the Civil Code stipulates that the trustee has the obligation to preserve the assets of the principal during the execution of the mandate (art. 2019 para. 2) and that the acts of preservation may include the sale of these goods, in cases of emergency (art. 2024 para. 2).

Regarding the form of proxy, art. 1301 Civil Code specifies, in a general manner, the fact that it will only be effective if it is given in compliance with the forms required *ad validitatem* by law for the conclusion of the contract that the representative is to conclude on behalf of the represented. In the context of doctrinal discussions about the form conditions of the mandate contract, controversies arose related to the validity of the tacit mandate. The regulation contained in art. 2013 para. (1) of the new Civil Code does not repeat the provision of art. 1533 of the old Civil Code, which explicitly recognized two types of mandate: the tacit mandate and the explicit one. Therefore, the doctrine raised the question whether, under the new provisions, the tacit mandate can still be recognized, the current regulation making explicit reference only to the tacit acceptance of the mandate, but remaining silent on the tacit offer to contract. We believe that this issue has been clarified, since jurisprudence and doctrine have repeatedly confirmed the admissibility of any means of proof of the tacit mandate, both regarding its conferment and acceptance, these means of proof being left to the discretion of the courts of judgment. Thus, the proof of the tacit mandate can be produced both by the parties and by third party contractors or other third parties, through any means of evidence allowed by law, which prove the undoubted intention of the parties to confer or accept the mandate,

regardless of the value of the act for the conclusion of which the mandate was conferred. The requirement of a document necessary *ad probationem* would contravene the very notion of a tacit mandate, since the written mandate is, by definition, explicit.

In our article, we shall focus on the analysis of the legal capacity of the parties to contract, as a fundamental condition necessary for the valid conclusion of the mandate contract.

2. The legal capacity required of the parties to conclude a mandate contract

Regarding the capacity of the parties to contract, the relevant rules are, according to art. 1181 Civil Code, mainly those regulated in Book I of the Civil Code, entitled *"About persons."*

However, in addition, the legislator enshrines specific regulations for the institution of representation (art. 1295-1314 Civil Code), where there is also a special provision regarding the capacity required of the parties in the case of conventional representation, a provision that is obviously incidental to the matter of the mandate.

Thus, art. 1298 Civil Code explicitly mentions that *"in the case of conventional representation, both the represented and the representative must have the capacity to conclude the act for which the representation was given."*

This unequivocal legal regulation puts an end to doctrinal controversies prior to the new Civil Code, generated by the question of whether or not it is necessary for the representative to have full exercise capacity in order to validly conclude the legal operation for which he was empowered.

In French law, for example, art. 1990 Civil Code explicitly stipulates that *"an unemancipated minor can be chosen as a trustee"*, of course with the consequence that he will only be held accountable by the principal within the limits in which the law allows minors to oblige themselves. Thus, *"the incapacity of the representative does not constitute an obstacle to the validity of a contract that he concludes on behalf of the represented one"* (Mazeaud et al., 1998: 147).

Similar opinions were expressed in Romanian doctrine as well.

Thus, some authors (Hamangiu et al., 1943: 107; Alexandrescu, 1910: 570-571; Safta-Romano, 1999: 237; Murzea et al., 2007: 7) expressed the opinion that it is sufficient for the representative to have limited exercise capacity, since the effects of the act he concludes with the third party contractor will be produced on the represented, not on him.

A similar opinion (Vasilescu, 2003: 221), somewhat more nuanced, is the one that claims that the representative must have full capacity to exercise only at the time of concluding the representation agreement, because by this he is personally bound; regarding the act that he concludes on behalf of the represented, since this does not bind the representative, but the represented, it is sufficient for the authorized person to express an untainted consent at the time of making the agreement with the contracting third party, not being required to have the ability to bind himself in relation to the completed act. Therefore, the minor with limited exercise capacity could conclude, as a representative, a legal act that he could not validly perform for himself.

These opinions were contested by other authors (Deak, 1999: 344-345; Ghimpu et al., 1960: 323; Chirică, 1997: 258-259; Sanilevici, 1982: 201-202; Fircă, 2013: 324), who argue that when concluding a contract through representation, the representative must have full capacity to exercise, in order to be able to express a valid consent, as he is not just a passive element of the mechanism of representation, a simple bearer of the will of the represented person, but expresses his own will when completing the contract. His own will intervenes in the execution of the power of attorney, since the representative has a certain freedom of action regarding the way of carrying out his mission, which is limited only by the object and the limits of the power of representation set by the represented. Thus, it was argued that the representative should not be confused with a simple spokesperson (*nuntius*) of the represented one, differing from him precisely by the freedom of decision that the latter allows him, within the limits indicated in the proxy.

All these doctrinal views call for some commentary.

First of all, one must answer the question whether the trustee expresses the will of the principal at the conclusion of the act for which he was commissioned, or he also expresses his own will. Because if we believe that he only expresses the will of the principal, it will be enough that the latter has the ability to conclude the targeted act; as far as the trustee is concerned, he will only have to express a consent that is valid (to have discernment) and unblemished (art. 1299 Civil Code). If, on the contrary, we conclude that the representative expresses his own will at the conclusion of the targeted act, then he will have to have the ability to conclude that act himself.

Although the legislator repeatedly and explicitly indicates (art. 1309 para. 1; art. 2017 para. 1) that the representative will have to act only within the limits of the powers conferred by the represented in order for the act concluded with the third party to oblige the latter, however, stipulates some provisions that leave a certain freedom of action and initiative to the representative, which could make one conclude that his own will plays a role in the execution of the power of attorney.

Thus, paragraph (2) of art. 2017 Civil Code explicitly states that the trustee *"can deviate from the instructions received, if it is impossible for him to notify the principal in advance and it can be assumed that the latter would have approved the deviation, had he known the circumstances justifying it"*, provided that the principal is notified immediately. Also, art. 2023 para. (2) Civil Code stipulates that the agent, although personally bound to carry out the mandate, may still substitute a third party, even without an express authorization from the principal, if unforeseen circumstances that cannot be brought to the attention of the principal make the personal execution of the mandate impossible, and it is assumed that the principal would have approved the substitution, had he known these circumstances. In case of unauthorized substitution, the agent also has the obligation to bring it to the attention of the principal immediately. Finally, the legislator also provides that, even in the absence of a special mandate (that is necessary in principle for any acts of disposition, according to art. 2016 paragraph 2 Civil Code), in cases of emergency, the trustee can proceed to sell the assets of the principal, with the diligence of a good owner, in order to preserve their value, if the goods are at risk of depreciating, with the repeated condition of immediately notifying the principal (art. 2024 Civil Code). Moreover, not only the trustee himself, but even his heirs or representatives have

the obligation to continue the execution of the mandate even after the occurrence of a reason for terminating the contract (death, incapacity or bankruptcy of one of the contracting parties), in order to avoid jeopardizing the interests of the principal/ of his heirs, if such a risk would result from the delay in execution.

Therefore, although the legislator establishes, as a matter of principle, the obligation of the trustee to act only within the limits set by the principal, he allows the agent, in expressly and limitedly indicated situations, to exceed these limits. However, one cannot fail to notice the fact that such deviations from the mandate are allowed only for the purpose of protecting the principal's interests and only under the condition that the latter cannot express his will in the sense of extending the limits/duration of the mandate. We believe that this freedom of initiative that the legislator allows the agent is actually based on the presumed will of the principal to approve the respective acts of the agent, the trustee never being able to act, even in such situations, against the will of the principal, but only on the basis of the principal's will, which in such cases cannot be explicit, but only legally presumed. Moreover, this presumption is a relative one, the principal being able to prove the contrary, in order to engage the trustee's responsibility for the excessive acts, proving that he had knowledge of the contrary will of the principal. At the same time, the principal retains in any circumstances the right to revoke the mandate, based on art. 2031 para. (1) Civil Code. Also, nothing prevents the principal from giving precise and imperative instructions to the agent regarding not only the object or the duration of the contract, but also regarding the manner of executing the mandate, instructions that the agent will be required to comply with, since he accepted the mission.

The mandate is, in principle, according to its nature, a contract concluded in the interest of the principal, the latter retaining throughout its execution by the trustee the ability to modify it, to hold the trustee accountable for his management (art. 2019 para. 1 Civil Code) and in the last resort to revoke it "*at any time*" and without owing any explanation to the trustee, and, more than that, even breaching a contractual clause by which the parties would have declared the contract "*irrevocable*" (art. 2031 para. 1 Civil Code).

However, we believe that one must look at the mandate from a realistic perspective, compared to what it has become over time: it is no longer a service done between friends, free of charge and in the exclusive interest of the principal. The mandate has become professionalized: it represents, at the present time, a legal framework that allows the performance of professional services, in the performance of which the mandate holders have a greater freedom to choose the optimal methods by which to exercise their duties. Moreover, the agent himself often has a vested interest¹ in carrying out the business entrusted by the principal, a situation in which his freedom of action is all the more meaningful, and his own will expressed at the conclusion of the targeted act, all the more obvious. Therefore, as far as we are concerned, we believe that the trustee expresses not only the will of the principal in the execution of the power of attorney received, but also his own will.

Secondly, we believe that it is necessary to differentiate between two aspects: is it necessary for the agent to have full exercise capacity in order to be able to validly conclude the targeted act, or is he required to only have the capacity required of the principal himself to be able to conclude the respective operation? This is because, as we well know, those who lack full legal capacity, and even those

who are incapable, can conclude certain legal acts, within the limits established by law.

Of course that under the conditions of the explicit regulation established by the legislator in the new Civil Code, the clarification of this aspect is easy: art. 1298 Civil Code imposes for both the represented and the representative, *"the capacity to conclude the act for which the representation was given."*

Therefore, the capacity required of the agent will have to be related to the nature of the legal act for the conclusion of which he was authorized by the principal.

On the other hand, art. 41 para. (3) Civil Code provides that the minor with limited exercise capacity can conclude by himself preservation acts, administration acts that do not prejudice him, as well as disposition acts of small value, current in nature and executed on the date of their conclusion. Therefore, if the mandate contract itself, as well as the act with which the trustee is charged, belong to this category, we believe that it is also possible for them to be validly fulfilled by a minor trustee with limited exercise capacity, who acts alone, without the consent of his legal guardians.

Of course, the mandate will rarely be included in the category of acts listed by the quoted legal text, but it does not mean that this would be impossible. Besides, we don't see why it wouldn't be possible for a minor over 14 years of age to be empowered to conclude, for example, current acts of small value for the principal, as long as the minor, and even an incapacitated individual, could conclude such acts for their own benefit.

Moreover, the possibility for the minor with limited exercise capacity to become a trustee was enshrined by the initial regulations of the Civil Code from 1864, art. 1538, which provided that emancipated minors could be elected proxies, but this article was later amended by the Decree no. 185 of April 30th, 1949.

If, however, the mandate agreement or the act concluded by the trustee with limited exercise capacity cannot be included in the category of those acts that the legislator, by art. 41 para. (3) Civil Code, allows the person with limited exercise capacity to conclude by themselves, then they will be affected by relative nullity, even without proof of a prejudice (art. 44 Civil Code).

On the other hand, we consider that a mandate is perfectly valid, as well as the act concluded based on it, regardless of its nature, but on the condition that it is not an act prohibited by law to minors, even if the trustee is a minor with limited exercise capacity, if he obtains, at the latest, at the time of concluding the documents, the consent of his parents or, as the case may be, of his legal guardian, and in the cases provided by law, also the authorization of the guardianship court, both for the mandate contract and for the act that the minor concludes based on it (art. 41 para. 2 Civil Code). Some doctrinaires embraced this opinion even under the regulations of the 1864 Civil Code (Cosma, 1969: 96).

However, the legislator also establishes an exception, showing that *"a person lacking legal capacity or with limited legal capacity cannot be executor of a will"* (art. 1078 Civil Code). Therefore, the testamentary executor (trustee appointed by the testator, or by a third party appointed by the will, with the purpose of executing the testamentary dispositions, according to art. 1077 para. 1 Civil Code) will necessarily have to have full legal capacity.

As regards those who lack legal capacity (minors who have not reached the age of 14 and those prohibited by the court), although the legislator allows them to conclude on their own, in addition to the specific acts provided by law, also preservation acts, as well as disposition acts of small value, current in nature and executed at the time of their conclusion (art. 43 para. 3 Civil Code), we do not consider that these persons can validly conclude contracts as representatives, since, on the one hand, the mandate cannot be included in the category of acts that the legislator allows the incapable to conclude, and on the other hand, these persons, being totally lacking in discernment, could not express a valid consent at the conclusion of the targeted act, as required by art. 1299 Civil Code. Moreover, this conclusion results from the *per a contrario* interpretation of the provisions of art. 2030 para. (1) letter c) Civil Code. Thus, if the mandate is extinguished by the incapacity of the trustee, it follows that a mandate concluded with an incapacitated person cannot be valid. However, legal doctrine has also recorded opinions in the sense of admitting the validity of a mandate conferred to an incapacitated person (Fircă, 2013: 324).

The legislator also establishes certain exceptional situations, in which the mandate must be continued by the trustee who has become incapacitated (as a result of his being placed under a court ban), but he will have to exercise his powers through his representatives.

Thus, paragraph (2) of art. 2030 Civil Code states that, in the case of the mandate whose object is the conclusion of successive acts within an ongoing activity, it will continue despite the occurrence of a cause for its termination, including incapacity of the trustee. Moreover, regardless of the type of activity that is the object of the mandate, its execution will have to be continued even after the incapacity of the trustee (or other causes of termination of the mandate, provided by art. 2035 Civil Code), if the delay risks putting in danger the interests of the principal or those of his heirs (art. 2035 para. 2 Civil Code). From the interpretation of the aforementioned legal regulations, we deduce that in such situations, the trustee who has become incapacitated will not be able to continue the execution of the mandate personally, but this obligation will have to be carried out through his representatives, which is natural, considering the fact that, as we have said, the execution of the mandate does not fall into the category of those acts, mentioned by art. 43 para. (3) Civil Code, which the incapacitated person can conclude by himself.

We believe that the occurrence of the trustee's "*incapacity*", as it is understood by the legislator as a cause for the termination of the mandate, only means placing him under judicial prohibition. It does not call for, as argued in doctrine (Deak, 1999: 345; Fircă, 2013: 324), the necessity of the full exercise capacity of the trustee. The incapacity can only occur as a result of the person being placed under a judicial ban, due to his lack of discernment, while a restriction of the trustee's capacity to exercise cannot occur after the conferment of the mandate, it being a state that characterizes the minor until reaching the age of adulthood. It is true that the measure of placing an individual under judicial prohibition, according to art. 164 para. (2) Civil Code, can also be ordered on minors with limited exercise capacity, but they are not considered from start as incompetent, but only if it is found in court that they do not have the necessary discernment to look after their own interests. Therefore, in the case of minors with limited exercise capacity, we believe that they

are capable of becoming trustees, as long as they are not placed under a court ban (this statement is also valid for adults with full exercise capacity).

Of course, it is unlikely that a person will choose to be represented by a trustee with limited exercise capacity, considering that he will be able to be held responsible for the concluded documents, both to the principal and to the contracting third party, only according to the general rules regarding the obligations of the incapable, that is only within the limits of his enrichment. Thus, according to art. 1647 para. (1) Civil Code, *"the person who does not have full exercise capacity is not required to return benefits except to the extent of his enrichment, assessed on the date of the request for restitution."* However, the legislator states that *"they can be held to full restitution when, with intent or serious fault, they made restitution impossible"* (art. 1647 para. 2 Civil Code). In relation to the contracting third party, the principal will be bound as if the trustee had full exercise capacity (Mazeaud et al., 1963: 679-680).

As far as the principal is concerned, he must have the capacity required by law to be able to conclude the legal acts for which he instructs the trustee, considering that they will produce their effects in his person and in his patrimony, he becoming a creditor and respectively debtor of third party contractors as party to the respective operations. This means that the principal will have to be a capable person, since the occurrence of his incapacity, as a result of being placed under judicial interdiction, determines the termination of the mandate contract, according to the provisions of art. 2030 para. (1) letter c) Civil Code. However, as it happens in the case of the trustee who has become incapacitated, the legislator stipulates that in certain situations this rule is derogated from, in the sense that the mandate will continue even after the occurrence of the principal's incapacity. We are referring to the exceptions provided in art. 2030 para. (2) and art. 2035 para. (2) Civil Code, which we have previously mentioned, providing the continuation of the mandate regardless of the occurrence of the trustee's or principal's incapacity, or of any of the other causes of contract termination provided by the aforementioned articles. In addition, for the situation of the principal's lack of legal capacity, the Code of Civil Procedures provides for a regulation of a special nature, which concerns the mandate of judicial representation. It *"does not cease with the death of the one who gave it, nor if he became incapacitated. The mandate lasts until it is withdrawn by the heirs or by the legal representative of the incapacitated"* (art. 88 Code of Civil Procedures).

Therefore, the legislator regulates several situations that except from the rule of the capacity of the parties, in which it is possible (even mandatory, but respecting the right of revocation/renunciation of the parties) to continue the mandate even after the occurrence of the principal's or the trustee's incapacity.

Another aspect that must be mentioned in relation to the capacity required of the parties is the temporal one. In the doctrine, various opinions were expressed regarding the moment at which the parties must have the capacity to exercise (at least the restricted one, in our opinion). Of course, both the represented and the representative must be capable at the time of concluding the representation convention. At the same time, the representative will have to keep this capacity at the moment of concluding the act for which he was empowered, since he is the one who expresses the consent.

The controversies arise in relation to the capacity of the represented, namely whether it must persist at the time of concluding the targeted act by the representative, or whether it is sufficient that the represented was capable at the time when he conferred the power of attorney.

Thus, an author claims that *"the representative and the represented must have full capacity to exercise at the time of concluding the contract of mandate with representation, and the representative also at the time of concluding with the third party the legal act that is the object of representation"* (Sitaru, 2010: 158), from which we infer that this capacity is not required for the represented at the time of conclusion of the targeted act.

In another opinion expressed by French doctrine, it is argued that, on the contrary, the assessment of the existence of the capacity of the principal to confer the mandate must be related to the date of its execution, and not to the date of its conferment. This author (Martin, 2003: 353-357) supports the theory of the *"continuous"* formation of the mandate contract, according to which the will of the principal to *"double"* his legal power in the person of the trustee is continuously formed and expressed throughout the duration of the mandate. As a result, the legal inability to express an effective will, at any moment it may appear, paralyzes the continuous formation of the mandate, which, under these conditions, disappears. Therefore, *"the termination of the mandate is self-evident in the case of the principal's incapacity"*, since *"the represented must be capable at the time of concluding the act performed on his behalf"* (Mazeaud et al., 1963: 611). It is fundamentally justified by the simultaneous expiry of the mandate at the moment of the occurrence of the inability of one of the parties to express the valid will that creates it.

Finally, it was also argued that the represented should have full exercise capacity at the time of concluding the representation convention, this being necessary for the valid creation of the mandate, whereas at the time of concluding the targeted act, the represented should be able to assume obligations, a capacity that will be assessed in relation to the respective act (Vasilescu, 2003: 221).

As far as we are concerned, we do not believe that a person must have full capacity to exercise to be able to confer a valid mandate, as long as the mandate and the act that will be concluded based on it can be classified among those acts that minors with limited exercise capacity can conclude by themselves, according to art. 41 para. 3 Civil Code. Moreover, if he benefits from the approval of the legal guardians and, when required, according to the nature of the object of the act to be concluded by the trustee, from the authorization of the guardianship court (when the targeted act is an act of disposition), we believe that the minor with limited exercise capacity will be able to conclude any type of legal transaction through a trustee, except for those prohibited by law to minors. As stated in the doctrine, the minor with limited exercise capacity *"can give a mandate to someone else, validly, to conclude those legal acts, which he himself can conclude personally and alone; as, if there is the prior consent of the legal guardian, he can also give a mandate for the conclusion of a civil legal act for which the law requires such consent"* (Beleiu, 1982: 120).

In specialized literature (Sanilevici, 1982: 210; Manoliu et al., 1985: 5), the opinion was expressed that the principal with limited exercise capacity will need the consent of his legal guardians and the authorization of the guardianship court

whenever the mandate has an onerous nature, being considered an act of disposition, regardless of the nature of the targeted act, which may be a preservation or an administration act. However, another doctrinaire (Deak, 1999: 343-344), brought justified criticism to this guideline, showing that the principal is required to have a capacity that depends not on the nature of the mandate itself - onerous or free of charge -, but on the nature of the act that is intended to be concluded through the trustee. Thus, for example, the mandate, even with onerous title, being related to the level of the principal's entire estate, can be an act of administration, not of disposition, if it is conferred for the performance of an act of administration of his patrimony (for example, for hiring a contractor to make repairs to some of the principal's buildings, with the aim of preventing their value depreciation). Therefore, the simple remunerated character of the mandate does not automatically give it the nature of an act of disposition, for the conclusion of which the principal with limited exercise capacity needs the authorization of the guardianship court. Thus, it is possible, indeed, that the mandate "borrows" the legal nature of the targeted act, it being in itself, as stated in the doctrine, only a "neutral act" (Rizoiu, 2009: 180-234), the purpose of which is achieved precisely by the act for which it was conferred.

Regarding the issue of the need to maintain the principal's capacity at the time the trustee concludes the targeted act, we believe that this is undoubtedly necessary, since the act will generate effects directly on his person and his patrimony, and the trustee expresses at the time of concluding the operation the principal's will to oblige, this having to be the expression of current discernment. Moreover, the legislator himself unequivocally provides that the mandate ceases due to the incapacity of the principal (as follows from art. 2030 para. 1 Civil Code), with the exception of the previously mentioned situations, regulated by art. 2030 para. (2), art. 2035 para. (2) Civil Code and art. 88 Code of Civil Procedures.

Of course, it is difficult to assess what was the internal will of the principal at the time of conferring the mandate, more precisely if he wanted to maintain the power of attorney even in the event of his subsequent incapacity. The same problem has given rise to many doctrinal controversies related to the possibility of conferring a *post mortem* mandate, the validity of which is nevertheless recognized, the power of attorney clause for the cause of death being otherwise frequently used in various types of contracts. However, the situation is different from that of incapacity: while death is a foreseeable event, and a person can explicitly express their will by legal documents for the very cause of death, on the other hand, it is difficult to presume a tacit will to continue a contract in the event of incapacity one of the contracting parties, a situation that certainly no contractor anticipates at the time of concluding an agreement. In such situations, it is the role of the representative of the incapable person to decide on the best way to achieve their interests.

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SECTION FINANCE, BANKING, ACCOUNTING AND AUDIT

COMPARATIVE ANALYSIS OF CRYPTOCURRENCIES VERSUS FIAT MONEY

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Abstract: *This article aims to provide a comparative analysis of cryptocurrencies and fiat money, in the context in which the former might be considered an alternative to the latter. Mainly, we perform a literature review and qualitative analysis of 64 articles from Web of Science Core Collection, published between 2017 and 2023, using as keywords “cryptocurrencies” and “fiat money”. The information processing methodology involved presenting the data and information concisely, in order to gain a point of view on how crypto assets can be perceived in comparison with other financial assets. The results present the authors' conclusions regarding the economic differences and similarities between cryptocurrencies and traditional money. It also includes the limitations of the research and offers future directions for study.*

Keywords: cryptocurrencies, fiat money, bitcoin, blockchain, crypto assets, banking

JEL Classification: G15, G32, M40, O39, Q55

1.Introduction

The development of contemporary economic and financial systems is based on monetary and payment systems, which, along with the development of technology, are in permanent evolution (Kourmpetis and Gazis, 2022). The classic model where the central bank maintains monetary and financial stability can be contrasted with the new decentralised model based on the blockchain technology that supports cryptocurrencies. In this context, Temperini and Corsi (2023) mention, in their paper, the concept of economic *democratisation* with reference to the access and use of all monetary forms. Moreover, others are of the opinion that virtual currencies could even replace fiat currencies and thus avoid central banks (Gunay, et al., 2021). The purpose of this paper is to highlight the correlations and characteristics that exist between cryptocurrencies and fiat money.

The findings of the analysis highlight the similarities and differences between cryptocurrencies and traditional currencies. In this way, the authors want the article to contribute to the development of the study in this field and facilitate the understanding of investors and economic professionals.

1.1. Research methodology

The article is based on the systematic literature review and qualitative analysis of the specialised literature in which the association between cryptocurrencies and fiat currencies was found. Were considered various specialised publications on the Internet, at international level, which address the concepts of interest on the proposed topic. In addition, Web of Science Core Collection database was accessed to consult the published papers between 2017 and 2023 in which the key-terms “cryptocurrencies” and “fiat money” were found. Moreover, the market capitalisation was reflected as found on CoinMarketCap trading platform, in the period 2022 and 2023. This platform is sometimes used to obtain statistical data and graphs regarding the cryptoassets phenomenon.

1.2. Information processing

In explaining the points of view, from a theoretical perspective, different electronic sources were analysed for the purpose of defining cryptocurrencies and fiat currencies, and the most important observations will be highlighted. The database downloaded from the Web of Science Core Collection platform was processed using VOS viewer program. The result was to generate the key-terms cluster based on co-occurrence association strength method (Figure 1). Furthermore, certain statistical data were presented, such as the market capitalisation of cryptocurrencies and stablecoins, as available on the CoinMarketCap platform.

2. Analysis of specialised literature

This paper follows the trend of discussing the extent in which cryptocurrencies can replace fiat currencies by comparing their characteristics, properties, and functions. Initially, from the analysis of the 64 existing scientific works on the Web of Science Core Collection platform, according to the number of occurrences resulted 15 relevant key-terms. Among them, the high impact terms are: *cryptocurrency* which appeared 33 times, *bitcoin* with 22 appearances, *blockchain* with 14 appearances and *fiat money* with 11 appearances. Then, using the term association method, it can be seen from Figure 1 that the strongest links appear between *cryptocurrency*, *blockchain*, *bitcoin*, *fiat money* and *digital currency*. The simultaneous appearance in several scientific works is shown by connection nodes; as the size increases, it means the term has been used more often.

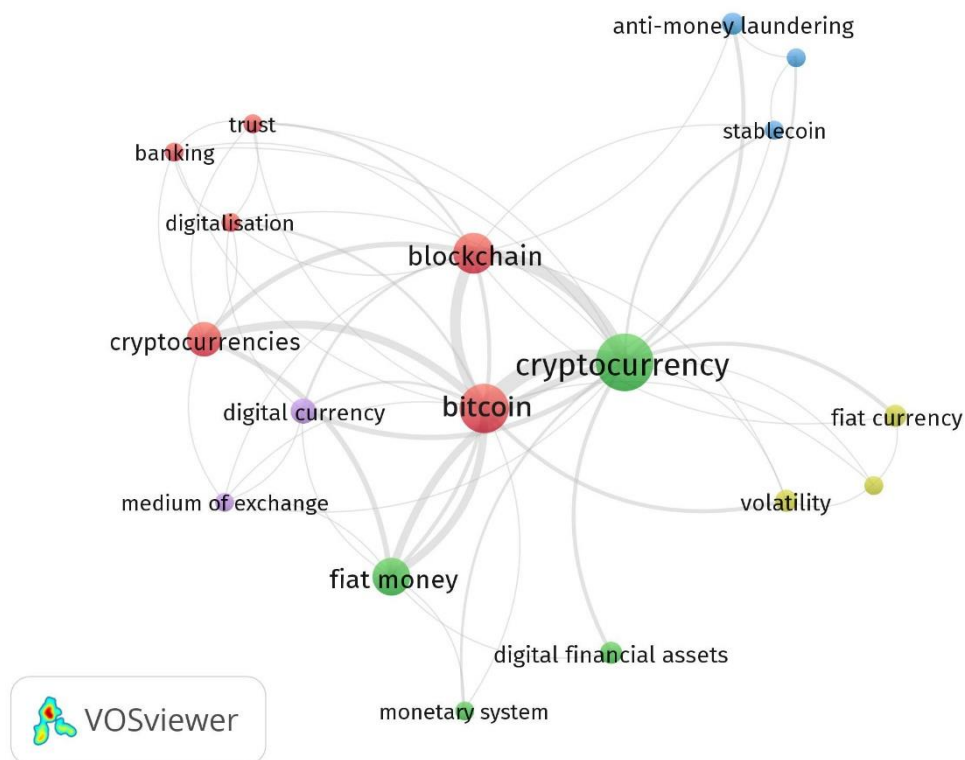


Figure 1: Key-terms cluster based on co-occurrence strength association method
Source: Authors' projection with VOS viewer from Web of Science database

2.1. Fiat currencies

Evolving from metal to paper or plastic, traditional money or coins represented a physical medium of exchange, transferable from one interested party to another. *The fiat currency* is a currency without intrinsic value, but whose declared value is recognised and validated by its users (Lukianchuk, 2022). In other words, fiat currencies represent cash that is used as a medium of exchange. Fiat currency is issued and controlled by central banks and governments, which provide oversight, prevent economic instability, and validate their value. Since the value of a coin is based on the trust of its users, when they lose trust, they tend to switch to another coin that they believe is more valuable (Jin, et al., 2021).

Going deeper, money is described by the English economist Jevons (1875) as having four functions: medium of exchange, unit of account, standard and store of value.

However, the current technological evolution that has led to the existence of mobile wallets and various payment applications such as Apple Pay or Google Pay, directs

society towards an economy devoid of liquid money, characterised by the term "cashless" (Lukianchuk, 2022).

2.2. Cryptocurrencies

According to the European Central Bank (2012), virtual currency does not have a legal physical equivalent, thus it is different from electronic money, respectively online bank accounts. The owner or issuer of the virtual currency is a non-financial private company and is not supervised in terms of monetary legislation.

Moreover, Venter (2018) warns, in the study about digital currencies, that the confusion between digital currencies and electronic currencies should be avoided. In terms of electronic currencies, the online bank account reflects the amount of money, in fiat currencies, existing in the account. In contrast, digital currencies are a medium of exchange that can only exist digitally, are not backed by any form of immobilisation, and do not exist in physical form. Their value fluctuates because it is influenced by the supply and demand relationship (Bunget and Trifa, 2023).

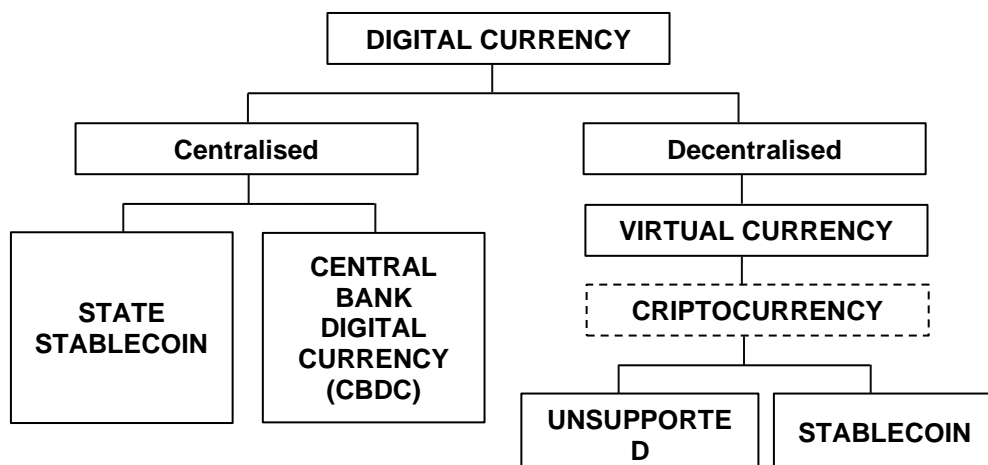


Figure 2: Structure of digital currency centralisation

Source: Authors' projection after European Central Bank (2012), Venter (2018) and Lukianchuk (2022)

The structure of digital currency centralisation is illustrated in Figure 2. Thus, digital currencies can be issued in a centralised or decentralised system. The centralised system involves state institutions, such as the central bank or a credit institution, that issue and hold digital currencies in a regulated framework.

Digital currency issued in a decentralised system, in a public, distributed ledger, is considered virtual currency. As a result, cryptocurrencies that are used as a means of payment, are a type of cryptographically based virtual currencies that are issued by private entities.

Cryptocurrencies or digital currencies represent a class of digital assets that were developed based on blockchain technology and appeared in 2009, when bitcoin

currency was launched on the market. They use cryptography as a method of ensuring security.

Cryptocurrencies can be divided into two main categories (Figure 2):

- *unsupported cryptocurrencies*, which derive their value from investors' expectations and usage, being characterised by volatility. They do not fulfil the fourth function of money mentioned by Jevons (1875), namely the element of storing value. The main cryptocurrency, *bitcoin*, and the alternative currencies on the market, *altcoins*, can be mentioned;
- *stablecoins* whose value is more stable because they are supported by financial assets that guarantee their value (Kourmpetis and Gazis, 2022). In their diversity, four categories are distinguished, depending on the factor that gives them the guarantee: stablecoins guaranteed by fiat currencies, stablecoins guaranteed by assets (gold), stablecoins guaranteed by other cryptocurrencies and algorithmic stablecoins (Temperini and Corsi, 2023).

Cryptocurrencies are based on the form of exchange that takes place strictly digitally. These digital currencies are characterised by limitations regarding their transformation into cash, respectively a high degree of risk regarding value fluctuations. Thus, cryptocurrencies are, in fact, a means of exchange in online transactions. However, since they are not fixed and determinable, they cannot represent a unit of account, a standard and a store of value.

Stablecoins were created to solve the problem of volatility and leverage blockchain technology. Stablecoins are cryptocurrencies that can be converted into fiat currencies. They can be managed in a centralised or decentralised system.

Starting from USD, it can be noted USDT centralised stablecoin issued by Tether, where 1 USDT is backed by 1 USD in the bank account of the issuer. Lukianchuk (2022) highlights in his article that there is a downside to centralised stablecoins, namely that the investor must trust the issuer regarding the unaltered holding of the physical monetary equivalent and the security of the stablecoins.



Figure 3: Market capitalisation of cryptocurrencies during November 2022 – October 2023

Source: Capture from CoinMarketCap.com (2023)

Along with the stablecoins issued in the centralised system, the central bank can issue its own currency, called CBDC (Central Bank Digital Currency). This is a form of digital money accessible online that aims to simplify digital transactions.

In contrast, decentralised stablecoins are managed by autonomous entities and operate on decentralised ledgers, and reserves can be publicly verified, thus solving the problem of trust (Lukianchuk, 2022).

Analysing the existing data on CoinMarketCap.com platform between November 2022 and October 2023, stablecoins occupy a proportion of approximately 10% of the cryptocurrency market. Figures 3 and 4 show that the total capitalisation of stablecoins USDT and USDC is \$115 billion, while the total capitalisation of the entire cryptocurrency market is \$1.2 trillion.



Figure 4: Market capitalisation of stablecoins USDT and USDC during November 2022 – October 2023

Source: Capture from CoinMarketCap.com (2023)

2.3. Differences between cryptocurrencies and fiat currencies

Initially, the interest in the purchase of cryptocurrencies was low, but in the following stages the value of digital currencies recorded an upward trend considering their recognition as a payment method by large online retailers. Thus, although fiat currencies and cryptocurrencies exist in two different systems, they can practically be used as a medium of exchange. However, certain properties can be observed in parallel, between fiat currencies and cryptocurrencies, in Table 2:

Table 2: Differences between properties of cryptocurrencies and fiat currencies

Property	Fiat currencies	Cryptocurrencies
Control	Centralised to central banks and government.	Decentralised; not controlled by a central authority.
Supply	Available unlimited; central banks can issue as many currencies as	Some cryptocurrencies are controlled and limited (bitcoin

Property	Fiat currencies	Cryptocurrencies
	they want. Exposed to inflation risk.	currency is limited to 21 million coins). There are newly created cryptocurrencies, but their rate is decreasing. Low inflation risk.
Protection	Due to anti-money laundering legislation and regulations, the beneficiaries can be identified.	Poorly regulated. Secured by cryptography. Cryptocurrency transactions do not benefit of total anonymity (are pseudonymous).
Immutability	Transactions with fiat currencies can be reversed.	Reversal of cryptocurrency transactions is not possible.
Divisibility	Divisible into smaller units.	Allow micro-transactions. For example, in the case of bitcoin, the smallest unit, the satoshi, is equal to one hundredth millions of one bitcoin.
Volatility	Their market value is stable.	High volatility.
Technology	Traditional money printing technologies.	Blockchain technology.

Source: Adapted from Kourmpetis, S. and Gazis, A. (2022); Binance Academy (2022)

Starting from control, the decentralised existence of cryptocurrencies allows greater freedom and autonomy in transactions, as users have more control over their funds and can avoid potential government regulations or restrictions. On the other hand, fiat currencies, which are government-issued, offer stability and acceptance.

Transactions made with cryptocurrencies are pseudonymous, meaning that they are not directly tied to the identities of the individuals involved. This provides a level of privacy that is not possible with fiat currencies, where transactions are typically traceable and can be linked to personal information, can be monitored by central banks or financial institutions (Amarasinghe, et al., 2021).

Analysing further, the distinctions between cash and cryptocurrencies, according to their functions mentioned by the European Central Bank (2022), are highlighted in Table 3. According to the studies undertaken by Bunget and Trifa (2023), an advantage of money in the form of cash would be the fact that cash can be used directly in making payments.

Table 3: Differences between cash and cryptocurrencies by functions

Functions	Cash	Cryptocurrencies
Autonomy	Cash is the only way for citizens to hold money without needing access to equipment, internet, or electrical power.	Cryptocurrencies can be kept in a private e-wallet. These transactions require access to equipment, internet, and electricity.
Legality	Creditors and suppliers cannot refuse cash collections unless they have agreed with their	Virtual currencies are not a form of exchange in the true sense of the term, as there are very few

Functions	Cash	Cryptocurrencies
	customers on another payment method.	merchants willing to work with such payments.
Integration	Using cash, opportunities are offered regarding payment instruments, respectively the possibilities to make savings.	The use of cryptocurrencies is possible only for people who have access to the internet and who have educated themselves for the purpose of using these trading tools.
Rapidity	Banknotes and coins allow immediate or scheduled payments.	Virtual currencies facilitate the automatic exchange of cryptocurrencies between accounts.
Safety	Cash is almost immune to fraud, counterfeiting and cybercrime.	Virtual currencies are unsupervised. The main risks associated with their volatility relate to suspected fraud or cybercrime.

Source: Authors' projection from the European Central Bank (2022); Bunget and Trifa (2023)

Figure 5 illustrates how traditional currencies are traded compared to cryptocurrencies. According to Islam, et al. (2018), the authors state that in a centralised system, traditional currencies are issued by the government or central banks, and transactions between individuals are controlled. In contrast, cryptocurrency transactions operate in decentralised structures that allow the existence outside of central banks or governments. Each transaction must be validated by users in the network to avoid defrauding the system (Bunget and Trifa, 2023).

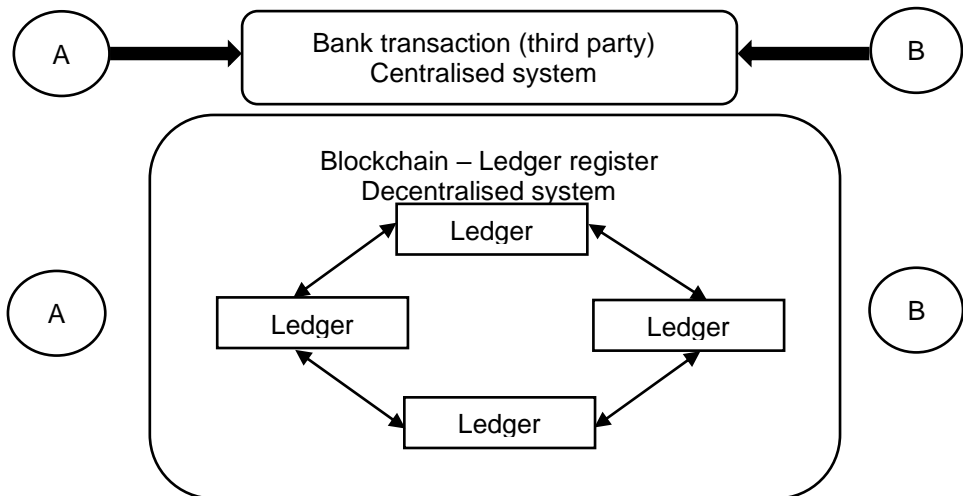


Figure 5: Comparison between cryptocurrency transactions and bank transactions
Source: Adapted from Islam, et al. (2018)

Satoshi Nakamoto (2008) supports in his work the idea that the distributed ledger system could eliminate the need for intermediate financial institutions to mediate transactions for a fee. As a result, Table 4 highlights the entities involved in transactions with fiat currencies, respectively with cryptocurrencies, processed according to Vaz and Brown (2020).

Table 4: Institutional penetration levels of fiat currencies and cryptocurrencies

Level	Fiat currencies	Cryptocurrencies
1	Transactions between individuals	Transactions between individuals
2	Transactions between legal entities	Transactions between legal entities
3	Transfer and payment system (regulated by central bank)	The blockchain platform (consensus based)
4	Banks and financial institutions	
5	Central banks	
6	Government	
7	International institutions: IMF (International Monetary Fund), BIS (Bank for International Settlements)	

Source: Adapted from Vaz and Brown (2020)

Regarding the first two levels, both fiat money and cryptocurrency transactions can involve individuals and legal entities. The first change comes from the third level, where fiat currencies are traded within specific systems regulated by the central bank, and cryptocurrencies are traded on blockchain platforms. The following levels are only addressed to institutions that, since they are under the regulatory umbrella, benefit from trust; here only fiat currencies are traded (Vaz and Brown, 2020).

3. Conclusion

In this article, the characteristics of cryptocurrencies have been exposed in parallel with traditional currencies, after consulting various specialised sources in the field.

As a result, money in the modern context can include cryptocurrencies which, although not monetary instruments, can be used as an additional option in transactions. Similar to Lukianchuk (2022), the authors believe that in the case of payment with cryptocurrencies, they will be converted into the main means of payment, i.e., the currency of the central bank, at the exchange rate valid on the date of the transaction. Arguably, in some transactions, the most viable substitute for traditional currencies are stablecoins.

The authors draw attention to the fact that unlike banking transactions with traditional currencies, which according to Kameir (2019), have a longer transfer time, transactions based on blockchain technology are final and irreversible, and the recipient can use the funds immediately.

Regarding the limitations when researching cryptocurrencies, the authors found out that there is limited data availability. The cryptocurrency market is fragmented, with multiple exchanges and currencies that lack standardised reporting and

transparency. This makes it challenging to obtain reliable and comparable data for research purposes.

In terms of suggesting directions for further research, these may consist of analyses of the correlation between cryptocurrencies and other assets that may be of interest to economics professionals and investors.

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OIL PRICE SHOCKS AND ITS EFFECTS ON INFLATION

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Abstract: *The conflict between Russia and Ukraine had macroeconomic effects, caused especially by the sudden changes in the energy market. These destabilizations came on an economic background, already affected by the Covid-19 pandemic. We examined how the facts that happened lately had any influence on the global energy and oil market. On the other hand, we analyzed the connection between the changes of the oil prices and the level of inflation. This connection has been explored in the 1970s-1980s, when there was registered a great growth of the oil prices. In 2021, inflation began to register significant increases. We wanted to see how this trend of increasing inflation was influenced by the recent events from the oil market. We discussed how these changes determined the inflationary tension in the last period and how was the transmission of oil supply shocks in the US and Euro Area. The price of unrefined oil is not included in the calculation of the direct basket of inflation, but it is indirectly reflected in fuel prices, which determine the increase in transport costs and automatically lead to a series of price increases on the goods and services market. The objective of central banks to maintain price stability is very important, but also difficult, because every country can react differently to oil supply shocks.*

Keywords: *Oil price, energy price, inflation.*

JEL Classification: *E31, G01, Q43.*

1. Introduction

The link between oil price fluctuation and inflation fluctuation initially has been explored in the 1970s and early 1980s, when was registered a great growth in the oil price and inflation automatically increased.

In 2021, inflation started to increase a lot. The main factors that contributed to this upward trend were: overheated markets, supply chain disruptions, changes in consumer demand for goods and services, rising food and energy prices (Baumeister, 2023). One of the main factor of influence in the last period was the change in the price of fuel, respectively of electricity, on the background of the outbreak the conflict between Russia and Ukraine. We want to see to what degree the change in the oil price was a factor of influence for the level of the inflation rate. Economists like Liu (2022), Baumeister (2022), (2023), Hasenzagl (2022) analyzed the fluctuation of the energy price and its influence on the macroeconomy.

The relationship between the change in inflation and the change in energy prices depends on specific economic and market conditions. Sudden changes in energy prices, resulting from sudden changes in demand and supply on the energy market, cause fluctuations in the prices of goods and services, thus influencing inflation in one sense or another.

2. Global oil market

In recent years, global macro economy was shaken by the Covid-19 pandemic, started in 2020, followed by Russia's invasion in Ukraine, in 2022. These events have considerably remodeled the energy market in the last three years, with a great impact on macoeconomic variables and on political decisions. In Figure 1, we analyzed the variation of oil production in the period 2018-2023, for USA, Russia and Saudi Arabia, these beeing the top 3 producers worldwide.

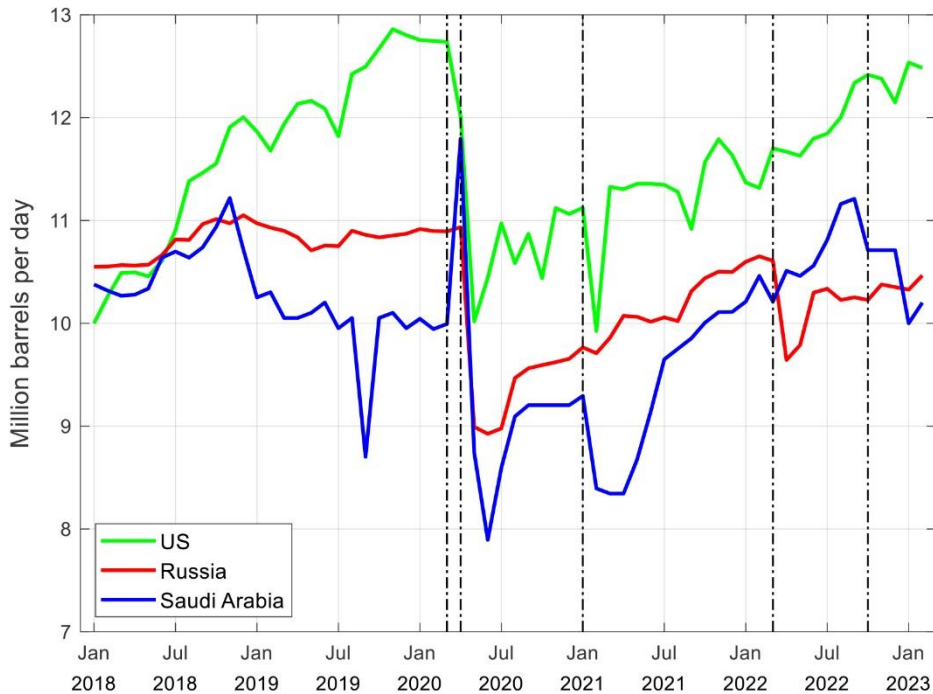


Figure 1: The evolution of oil production, 2018-2023

Source: Baumeister, 2023

When pandemic started, there were numerous shutdowns worldwide. Because of this, the demand for oil has fallen dramatically and the US production falling by nearly three million barrels per day in two months. The sharp decrease of global oil made

that OPEC+ to call for oil production cuts. But Russia initially refused to cooperate with OPEC+ to stabilize oil prices, which triggered a price war between the two main oil exporters, Russia and Saudi Arabia.

„OPEC+ is an informal alliance between OPEC member countries and ten other oil-producing nations, established in 2016. Russia is the main participant, given that it accounts for about 13% of global oil production. In April 2020, Saudi Arabia increased oil production as a punishment for Russia's non-compliance. Saudi Arabia flooded an already oversupplied market with nearly 2 mbpd of crude oil, sending oil prices lower” (Baumeister, 2023).

Lately, in April 2020 OPEC+ created an agreement to decrease oil production by 10%, in order to drive up the oil price. But this stabilization lasted only a short time, because at the beginning of 2021, the second wave of restrictions due to the pandemic came. The following year, in February 2022, Russia attacked Ukraine, which caused a drop in its oil production of about 1 mbpd, which was partially reversed as Russia developed new export markets. After Saudi Arabia increased production above pre-pandemic levels, in October 2022 OPEC+ announced a production cut of 2 mbpd, with the aim of stopping the drop in oil prices. This drop in prices was caused by the fear of recession, due to the tightening of monetary measures by the world's major central banks (Baumeister, 2023).

Saudi Arabia cut oil production to 10 mbpd, reaching its pre-pandemic average. Until February 2023, US and Russian oil production has not returned to pre-pandemic levels (Baumeister, 2023).

Time period	<i>Actual real oil price growth</i>	<i>Oil supply shock</i>	<i>Economic activity shock</i>	<i>Oil consumption demand shock</i>	<i>Oil inventory demand shock</i>
	(1)	(2)	(3)	(4)	(5)
April-Aug 2020	87.7	47.8	10.8	24.6	0.8
Oct 2020-Oct 2021	67.1	10.2	6.8	51.9	-2.1
Dec 2021-Feb 2022	25.7	5.0	5.6	15.0	0.1
March 2022-June 2022	19.9	12.4	-3.2	11.0	-1.3
June 2022-Sept 2022	-31.9	-4.3	1.2	-25.0	-2.8
Oct 2022-Dec 2022	-14.6	2.2	-2.3	-11.4	-1.8

Table 1. Oil Price Fluctuations, 2020-2022

Source: Baumeister, 2023

3. Russian oil market

After Russia's invasion in Ukraine, the Russian oil market suffered. Several European countries imposed sanctions on Russia and refused to buy oil from it. More and more countries in Europe began to buy North Sea oil, from the United Kingdom and Norway, thus increasing imports from the US. Russia has reoriented its oil export to Asia, especially India, competing directly with Saudi Arabia and the Gulf countries. Due to the war, several international energy companies withdrew from Russia, such as Shell, ExxonMobil and BP. Oil service companies such as Baker&Hughes, Schlumberger, Halliburton also withdrew. These withdrawals also affect Russia from the perspective of the lack of technological knowledge, which can affect its progress.

4. Policy measures and stability in the global oil market

Following the Russian invasion, the major oil-importing countries devised a set of political instruments, with the aim of ensuring stability on the world oil market and to fight against the global inflationary pressures.

Even if in the USA, Canada and Australia, oil imports from Russia are small, they have completely stopped Russian imports of crude oil.

In May 2022, EU member states banned most Russian oil imports, due to the EU's heavy dependence on Russian energy. The EU embargo referred in particular to purchases of oil by sea. Before the outbreak of war, almost half of Russian crude oil exports were headed to the EU (Baumeister, 2023).

The G7 countries introduced the price cap mechanism for internationally recognized shipping services, including insurance, shipping and brokerage for Russian goods. Some analysts have questioned the effectiveness of the EU embargo and of the price cap, as Russia has been able to find alternative buyers and maintain or even increase seaborne export volumes.

5. Oil prices, energy prices and inflation

In the first phase, the effects of the oil price increase will be felt in the price of oil-related products and the price of other energy goods and services that are part of the consumption basket. The price of unrefined oil is not included in the calculation of the direct basket of the inflation rate, but it is indirectly reflected in fuel prices, which determine the increase in transport costs and automatically lead to a series of price increases on the goods and services market.

The prices of refined products, such as gasoline and diesel, do not change in the same percentage as the oil price. The price of gasoline and diesel also depends on refining, marketing and distribution costs, as well as taxes, which differ from one period to another. It has been observed that in general, a sudden increase of 20% in the price of crude oil is reflected by a 10% increase in the consumption price of gasoline (Kilian and Zhou, 2023).

Other indirect effects may also occur. Sudden changes in the price of oil are very visible to the population, so they expect an increase in inflation. Thus, they will tend to negotiate their salaries, in relation to the level of inflation, in order to preserve their purchasing power. On the other hand, companies will increase their profit margins, precisely to counteract future inflationary effects. Such effects largely depend on the credibility of the monetary policy and the ability of the central banks to forecast a level of inflation as realistic as possible.

Central banks are concerned not only with the evolution of consumer price inflation during oil price shocks, but especially with inflationary expectations. The sudden price change on the oil market is expected to cause inflation in the short term, but the major concern is whether it also causes inflation in the long term.

A study by Kilian and Zhou (2023) analyzed the ways in which energy price shocks are transmitted to inflation (figure 2).

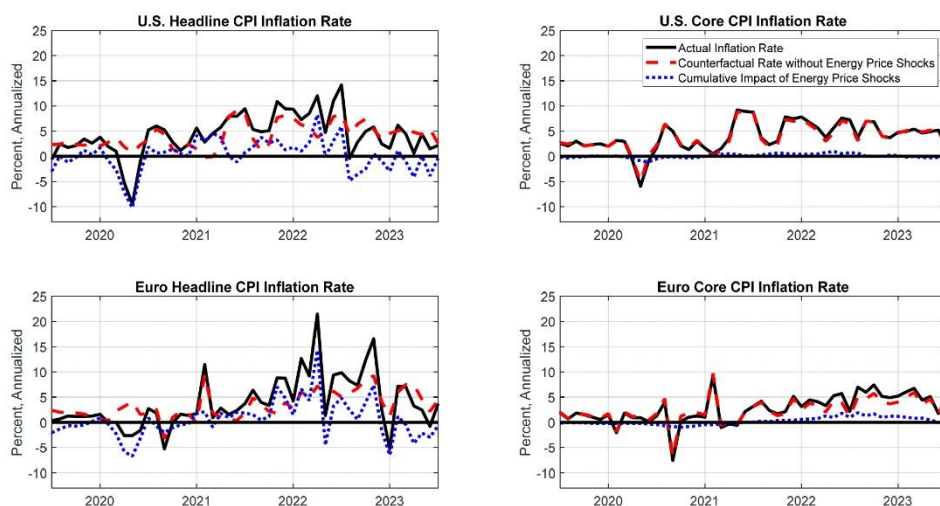


Figure 2. Cumulative Contribution of Consumer Energy Price Shocks in the U.S. and Euro Area, 2019-2023

Source: Kilian si Zhou, 2023

The change in the price of energy determined the biggest increase in basic consumer prices in the EU and in Great Britain. In Japan, inflation is less influenced by energy price shocks. The sudden changes in energy prices influenced inflation in the EU in period 2021-2022 to a greater extent than in the USA. There is no evidence for US or UK that energy price shocks have substantially modified inflation on long term (Kilian and Zhou, 2023).

Table 2 shows the effects of oil market shocks on consumer price inflation (Baumeister, 2023).

Time period	Actual change in inflation	Contribution of		Breakdown of contribution of demand shocks into		
		<i>oil supply shocks</i>	<i>demand shocks</i>	<i>economic activity</i>	<i>oil consumption</i>	<i>oil inventories</i>
	(1)	(2)	(3)	(4)	(5)	(6)
(a) United States						
Feb-Oct 21	4.5	0.10	1.42	0.13	1.24	0.05
Dec 21-Feb 22	0.8	0.03	0.31	0.12	0.17	0.01
March-June 22	0.4	0.29	0.06	0.03	0.03	0.00
June-Sept 22	-0.7	-0.15	-0.12	0.27	-0.37	-0.02
Oct-Dec 22	-1.3	0.05	-0.58	-0.27	-0.23	-0.07
(b) Euro Area						
June-Oct 21	2.1	-0.06	1.11	0.26	0.78	0.07
Dec 21-Feb 22	0.9	0.03	0.69	0.37	0.37	-0.05
March-June 22	1.2	0.20	0.22	-0.14	0.31	0.05
June-Sept 22	1.3	-0.08	0.29	0.52	-0.18	-0.05
Oct-Dec 22	-1.4	0.02	-0.24	-0.09	-0.10	-0.05

Table 2. Oil market shocks and inflation, 2021-2022

Source: Baumeister, 2023

6. Perspective

Recently, the monetary policy has adopted more restrictive measures, with the aim of reducing the level of the inflation rate. Rising interest rates are reflected in rising borrowing costs for firms and consumers, which could weaken economic activity and reduce demand for oil.

The ECB's objective of maintaining price stability across the euro area is difficult because member countries can react quite differently to oil supply shocks.

It is difficult to make a forecast, because there are a lot of uncertainties in the global oil market and it remains to be seen how they will evolve in the medium term.

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A MATCHING ANALYSIS OF ESG INFORMATION DISCLOSED IN SUSTAINABILITY AND FINANCIAL REPORTS OF HIGH- POLLUTING COMPANIES FROM THE OIL INDUSTRY

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Abstract: *The financial world has a prominent role to play in the global economic action plan. The financial sector together with stock exchanges around the world promotes sustainability, environmental (Environmental), social (Social), and governance (Governance), i.e. ESG factors, and the importance of incorporating them into investment decision-making and capital allocation to sustainable assets. The purpose of the undertaken study is to observe and analyze the extent to which the commitments made through the Sustainability Reports materialize and have financial quantifications in the Annual Financial Reports published by three large companies in the oil sector. The OMV Petrom ESG disclosure score determined based on the information in the sustainability report is very close to the ESG estimates score calculated from the financial report, which allows us to consider that the commitments in the sustainability report have been achieved.*

Keywords: *sustainability; annual reports; ESG; accounting estimates.*

JEL codes: *M41; Q56*

1. Introduction

In the global capital markets landscape, the integration of ESG (Environmental, Social, and Governance) criteria into capital allocation decisions by large investors has become a dominant theme. Investors place more emphasis on non-financial criteria, such as environmental impact, social relationships: relationships with employees, suppliers, and other partners, or the implementation and application of the highest standards of corporate governance to the analysis of companies in their investment universe.

Aspects regarding ESG are integrated into several areas of a company's operations, which has led us to seek the answer to the main research question if we can identify aspects of the Sustainability Report that also appear in the Annual Reports in the section accounting policies or accounting estimates. The specific questions consider how the ESG information is presented in the sustainability reports and whether it is quantified in the annual reports. Addressing issues concerning the ESG components

of these companies may be a guideline to entities that do not yet need to submit sustainability reports, but in the future will need to produce these reports.

2. Literature analysis

The ESG acronym was developed in 2004 by 20 financial institutions in the "Who Cares Wins" report (IFC, 2004) to respond to a call launched by Kofi Atta Annan, the 7th Secretary General of the United Nations. (Gillan, Koch, & Starks, 2021). Non-financial reports have become increasingly popular among investors because they can meet informational needs better than traditional financial reports. Financial crises and growing concerns about social and environmental consequences have dramatically increased external pressure on companies for more responsibility. (Manes Rossi, et al., 2018) ESG is a methodology for evaluating a company's environmental, social and governance performance. ESG evidence to indicate that their business model is not only profitable, but also responsible or sustainable is published by numerous companies. This reporting helps understand an organization's ESG issues, opportunities and impact. ESG scores have the greatest influence on energy sector stock returns. (Nitlarp & Kiattisin, 2022). The firm's ability to raise funds and attract investors is affected by its focus on ESG factors, so ESG aspects will affect a company's business strategy, operations and long-term value. However, many of these discussions do not mention any associated impact on a company's accounting estimates and financial statements. Potential effects of ESG aspects on a company's accounting and financial reporting in the context of existing accounting guidance and the current regulatory environment together with factors such as relevant regulatory, legal and contractual obligations, all entities should assess the financial and reporting implications of ESG accounting. (Knachel, et al., 2021)

3. Research Methodology

The mixed research (qualitative and quantitative) is based on a comparative analysis between the annual reports and the sustainability reports carried out through an in-depth analysis of the frameworks, which were obtained from the official websites of the companies, respectively from the stock exchanges where they are listed. The companies were selected from the oil industry based on the ESG scores calculated by Refinitiv, displayed on 25.02.2023. The main selection criterion was the presentation of sustainability reports starting with at least 2017 and the second selection criterion was that, geographically, they should be as close as possible to Romania. Therefore, we found that in Bulgaria, Serbia, Moldova, and Ukraine there are no companies in the oil industry to submit Sustainability Reports for our research period. The companies that met the criteria are OMV AG – Austria (ESG Score 85.25), OMV Petrom SA- Romania (ESG Score 74.33), Mol Magyar Olaj- és Gázipari

Nyrt – Hungary (ESG Score 66.86). The selected companies are relevant in terms of environmental impact, the oil sector being a sector with a high degree of pollution.

4. Results

For each ESG pillar, six themes were selected, which reflect the performance of a company in the specific field. The pillars of the sustainability reports and financial figures in the annual reports are presented in Figure. 1.

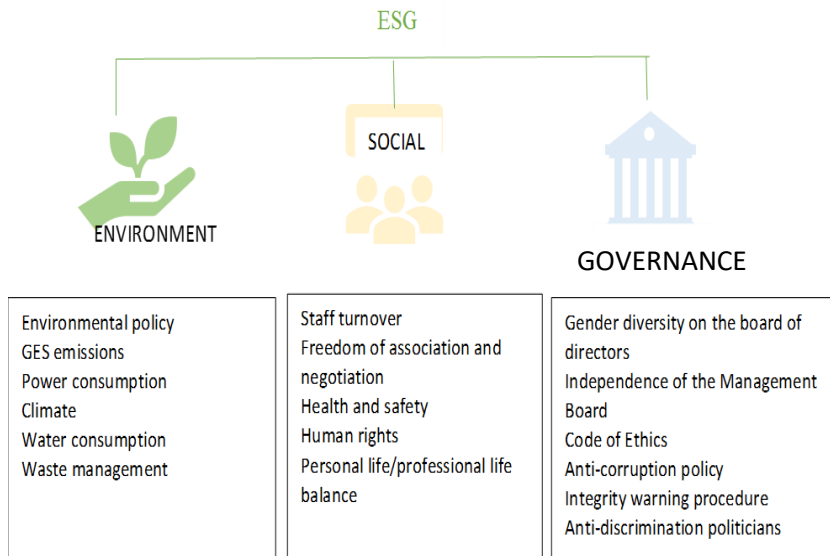


Figure. 1 – Aspects related to ESG researched

Source: author's projection by adapting the information from the BVB - Guide on ESG reporting-April 2022

For data analysis, we built two matrices. The matrix of scores awarded on the analyzed categories with the data collected from the Sustainability Reports, awarding the scores according to the definition given in the research methodology. Fig. 2 shows the points awarded from the two matrices. We built the map of the marks awarded with the help of the RACI Matrix program, to present the clouds of points regarding the fields under research. From this clouds matrix, we can read that most of the maximum marks (note 4) but also the most minimum marks (note 0) were given to the corporate governance pillar (blue dots), many minimum points were awarded because in the annual reports, we did not find information related to anti-corruption expenditure, nor for anti-discrimination expenses, which does not mean that these topics are not of the interest of companies.

Combating discrimination is an important and sensitive topic, and companies must take responsibility for creating a fair and non-discriminatory working environment for all their employees. The fight against corruption is also an important and sensitive issue in all companies. As regards MOL, MOL should take measures to prevent and fight corruption in all its forms, including corruption in the procurement process, in relations with customers, or relations with public authorities. The additional measures Mol could take would be to ensure transparency and integrity in the procurement process and decision-making, to ensure that there are no conflicts of interest and that all suppliers are treated fairly.

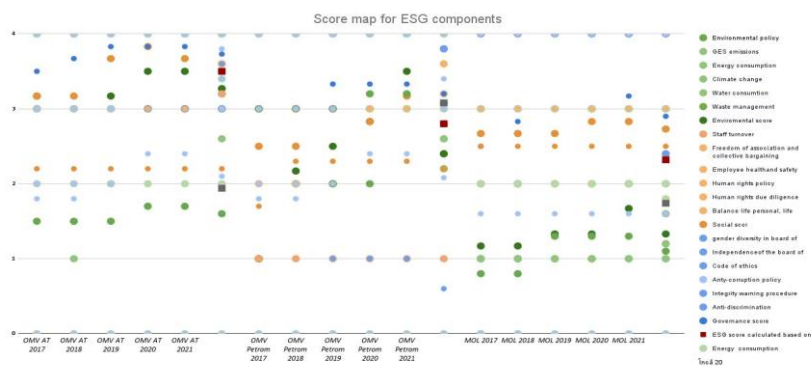


Figure. 2 – Score map for ESG components

Source: Own processing

We can identify the environmental cloud (green points) that on average is on the line of note 2, but in the matrix built OMV Austria is marked with a grade of 4 for environmental policies, has a well-developed environmental policy, towards these trends also tends OMV Petrom. Therefore, OMV has a well-defined environmental policy.

Topics related to social issues can be ranked on average between governance and environmental issues. The cloud of orange dots that represent the pillars of the social aspects is positioned between the line of points 2 and the line of points 3.

The environmental provisions have been estimated by the management of the companies based on the objectives of the environmental projects that companies should fulfill. Companies aim to reduce their impact on the environment by reducing greenhouse gas emissions and implementing a quality and environmental management system according to international standards. In this regard, OMV group follows a series of strategies, such as: reducing greenhouse gas emissions, reducing pollution, responsible waste management, and involving local communities through social and environmental partnerships and initiatives. These objectives are supported by a wide range of policies, procedures, and programs, which are implemented and monitored throughout the company. OMV Austria also focuses on developing innovative and sustainable solutions to reduce greenhouse gas emissions and protect the environment.

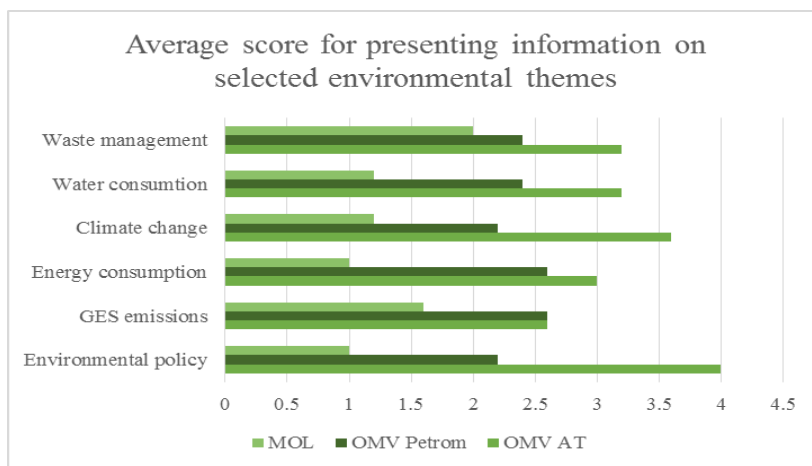


Figure. 3 – Presentation of the average scores of environmental items
Source: Own processing

Looking for information in the annual financial reports on accounting estimates related to the environmental aspects presented in Fig. 3, for OMV AG, no information was found for waste management, nor expenditure on water consumption, but provision was made for decommissioning and restoration obligations, in higher values than the other two companies. The cost of environmental provisions was the highest at OMV Petrom. OMV Petrom also presents separately the expenses related to energy consumption and water use, the other two companies do not present information related to these aspects.

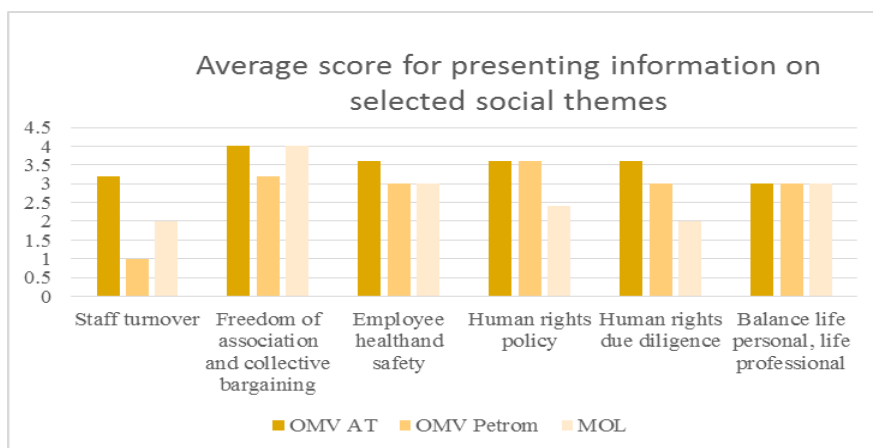


Figure. 4 – Presentation of the average scores of selected social items
Source: Own processing

The decrease in the number of employees can be seen in all three companies. The highest amounts of provisions for employees were constituted by OMV Petrom. Only at OMV Petrom was identified information on the death grants granted to employees. The provisions for the dismissal of employees were identified in OMV annual reports and the reports issued by MOL Nyrt. In addition to these, Mol Nyrt, when retiring employees, offers an allowance of three salaries, regardless of the period during which the employee was hired. Expenditure on employees at MOL is the highest. OMV AG Austria constituted the highest provisions for the dismissal of employees. In the sustainability reports, work-life balance aspects are well developed, but we have not been able to identify expenses on these issues in the companies' financial reports.

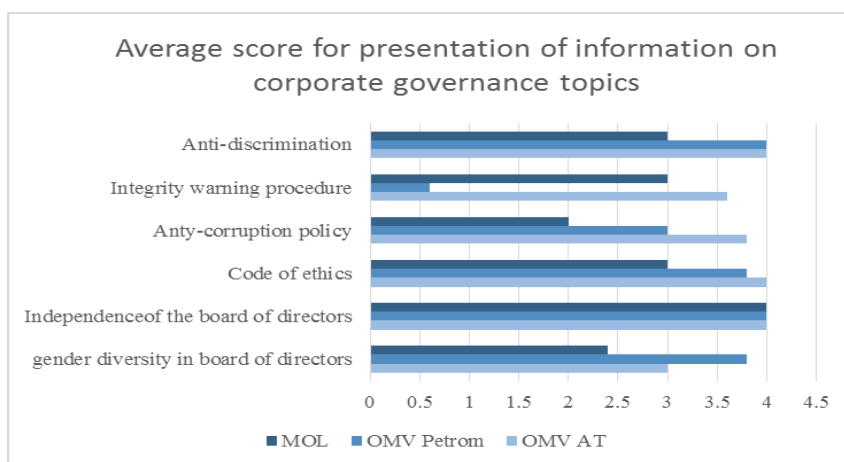


Figure. 5 - Presentation of average scores on corporate governance items
Source: Own processing

On corporate governance Fig. 5, the main observation refers to the fact that in the Mol group's annual report for 2020, the board of directors consisted of 8 members, of which 2 were women, which means a share of women on the board of 25%. MOL is also implementing a gender balance strategy in leadership, with the goal that, by 2030, 30% of the company's leaders will be women. According to the sustainability report of OMV Petrom Group in 2020, the gender ratio on the board of directors was 11.1% women. Currently, the board of directors of OMV Austria consists of 12 members, of whom 3 are women, which means a share of women of 25%. In 2020, OMV launched a program called "Women in Leadership" that aims to support and promote the presence of women in leadership and top leadership positions. Omv has also set itself to reach a 25% share of women in leadership and management positions by 2025 and to increase its share in the total number of employees. From the calculated average scores chart shown in Fig. 6, we can identify the average scores obtained separately for environmental aspects, social aspects,

corporate governance aspects, scores calculated according to the data from the annual reports, and calculated average scores of the accounting estimates for the analyzed information from the financial reports.

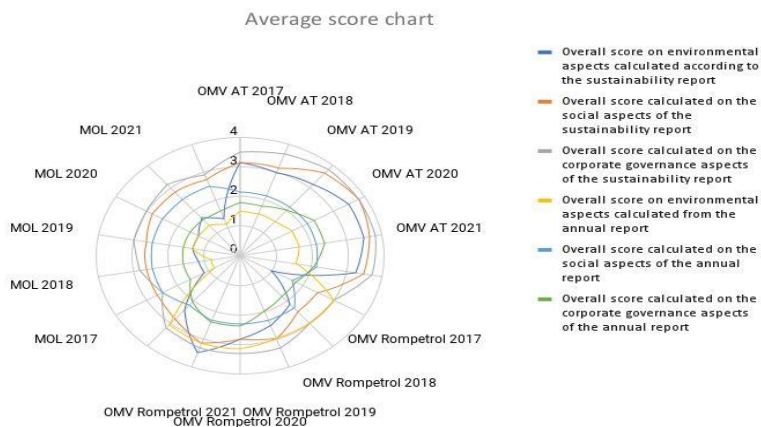


Figure. 6 – Chart of average scores

Source: Own processing

The ESG aspects in the sustainability reports and financial reports each scored an average score shown in Fig. 6, after which the ESG score was calculated. These ESG scores are shown in Fig. 7. From this figure it can be seen that OMV Petrom scores are closest to an ESG score from the sustainability report of 2.8 points and a score of ESG estimates in the financial report of 3.8 points, with a difference of 0.28 points between the two calculated ESG scores. OMV AG has a difference of 1.56 points, and Mol has a difference of 0.58 points.

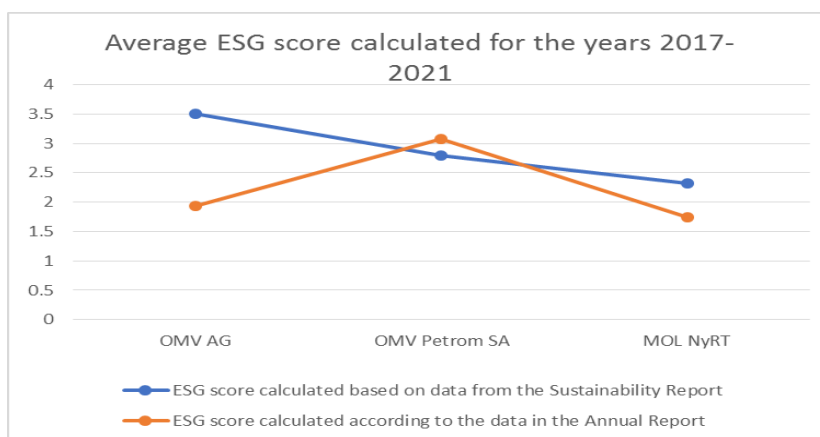


Figure. 7 – The ESG score is calculated based on data collected from the annual financial reports

Source: Own processing

5. Conclusions

Particular attention is paid to social issues, employees, and environmental issues at all three companies investigated, but the most comprehensive Sustainability Report is the one presented by the OMV AG group of companies in Austria. The information is easily accessible and how the report is drawn up facilitates faster reading by the user and the identification of the information sought. Mol Nyrt presents information briefly with a minimal degree of detail. OMV Petrom supports gender diversity and the promotion of women in management positions, although it recognizes the gender gap in the oil and gas industry. The information presented in the sustainability report by OMV Petrom, to the greatest extent, is also quantified in the financial report, compared to the other two companies examined. The sustainability report commits itself to a decrease in energy and water consumption, and this is also achieved by reducing the costs of energy consumption and water consumption.

Accordingly, companies have demonstrated a common awareness of the need to provide an exhaustive amount of social, environmental, and governance information to maintain investor interest and research. The limits of this research are found in the small number of investigated companies and of items/observations analyzed, in further research, this number could be extended to more listed European companies operating in various sectors of the economy. Data analysis can also be improved.

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PREDICTION OF FINANCIAL DISTRESS BASED ON ACCOUNTING INFORMATION

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Abstract: *When a company goes through a period of economic uncertainty, and its ability to keep operating in the foreseeable is called into question, all stakeholders are affected. In terms of economics a failure means that a company can't respect the economic principle of going concern, in some situations reaching insolvency or even bankruptcy. The research objective is identifying the key elements regarding the going concern of the companies' activity, and the accounting aspects which are contributing to the analysis of the level of risk faced by a company. According to the accounting rules, the management of the entities bears the responsibility for the preparation of financial statements in accordance with this principle. The hypothesis from which this research starts is that the models of discriminative analysis are the only way to verify the going concern assessment for a long-term period. Following the research, the factors that contribute to the assessment of the principle of going concern were identified, as well as an example of discriminative analysis to assess the risk of bankruptcy that an entity may face, or not in the foreseeable future. The research is based on going concern assessment, but also regarding the usefulness of data collection for business development. At the same time, a series of threats regarding the decision-making processes are pointed out, which may affect the activities of companies. The potential contribution of the study is to develop the literature on a current topic that should be a constant concern of companies, and it can highlight the usefulness of discriminative analysis to predict the financial distress a company may face.*

Keywords: going concern; financial difficulty; accounting; risk; uncertainty.

JEL Classification: M40; M41.

1. Introduction

The reactions of investors who requested an increased utility of the presented information in the decision-making process, determined substantial modifications in financial reporting. These modifications are the effect of the emerging economic procedures and progressive changes in contemporary accounting. It is quite hard for professionals to give up various techniques and principles previously used for decades, which is a sign of conservatism. On the other hand, the, the principle of

prudence is what makes them doubt whether the new solutions will generate the desired outcomes and if the data presented in the financial statements is going to be more relevant and correct (Wójcik-Jurkiewicz, Jurkiewicz, 2014).

The going concern assumption for a long-term perspective can be tested by using a series of models of discriminative analysis. Accountancy has a series of principles regarding the preparation of financial statements including this ongoing concern statement. To demonstrate this hypothesis, mentioned above, this research must answer the following questions:

- Does the going concern have any threats?
- Do the financial reports contain information regarding this principle?
- The discriminative analysis proves to be useful when evaluating any threats to the going concern?

There are a series of rules that must be considered when it comes to preparing and presenting the financial statements to the stakeholders. At the same time, one of the most important concepts in accordance with which the financial statements must be prepared is the concept of going concern. Going concern is defined as being the “assertion that an entity will not cease its activity but keep operating in the foreseeable future or at least until the subsequent reporting period”.

It also considers the company’s potential to produce the necessary resources to stay on the market and to avoid bankruptcy or insolvency. As Zéman and lentner (2018) are pointing out, the principle of going concern is realised to assure “an indefinite and uninterrupted sequence of transactions” and has a key contribution in the preparation of financial statements. In accordance with Hammond, Opoku and Kwakwa (2022), these statements reveal the idea that financial estimation and evaluation of the elements of assets and liabilities on the one hand and income and expenses, on the one hand, are affected by the principle of going concern. Also, the financial statements prepared based on this principle offer users the assurance that the company will continue its existence on the market soon, continuing to fulfil its objectives and aspirations. The idea of going concern of a company's activity is an essential criterion that investors consider when analysing the feasibility of investing in a company, especially because they know some financial failures that happened on the market, for example the case of Enron, WorldCom, Global Crossing Ltd., Kmart Corp. and other. So, the trust of the investors, in a company, is more solid if they have the going concern assessment guaranteed.

To answers for the above-mentioned questions, the paper contains a case-study based on the financial statements of a Romanian listed company, ALRO S.A., for the reporting period 2012-2022, which's data was used for a discriminative analysis, based on three well-known models.

2. Forecasting models for business failures

Most of companies are established intending to stay on the market for an indefinite period. The accounting assessment of going concern is a presumption that the company will manage its activity long enough to be able to pay off their obligations. When establishing the going concern assessment, the management of the company must take into consideration all data to which it has access in the moment of preparing the financial statements.

In accordance with Wójcik-Jurkiewicz and Karczewska (2019) when conducting an evaluation to recognize if a company has any symptoms of threats regarding the going concern, there are multiple methods that can be applied. These methods are classified according to some essential criteria, which will be presented in the following.

The first criterion relates to the nature of the factors based on which the solvency of a company is determined. Thus, the following methods are distinguished: quantitative, qualitative, and mixed. The quantitative method is analysing only measurable data. In the qualitative analyses, immeasurable data are considered, like the opinion of sellers, managers, experts, surveys on consumer objectives (Dittmann, 2008). The third method is using information from both qualitative and quantitative methods, so it is a mixed approach.

The other criterion refers to the possibilities of predicting the risk level regarding the solvency reduced. These techniques are established on logical and deductive argument and empirical deduction. Logical and deductive methods assume that the assessment of a company's solvency is carried out based on the analysis of some information that reflect the company's financial statement. Empirical methods of induction include mathematical and statistical analysis facilitating the comparison between companies, more than in the case of methods based on logic and deductive reasoning. The discriminative analysis is part of the empirical deduction models (the evaluation is carried out on certain reports, the choice of which is made following empirical research).

Several studies were made to develop models that can predict the business failures (Desai et al., 2020; Puspaningsih and Analia, 2020). These models were grouped in three large groups: statistical methods, soft computing methods, and theoretical methods, presented in Table 1. Over time, to predict the going concern assessment various models have emerged.

Table 1: The classification of bankruptcy forecasting models

Statistical methods	Methods of soft computing (artificial intelligence)	Theoretical methods
Discriminative analysis models Logit Models Probit models Decision trees Altman's Z-score Bankometer	Artificial neuron network Fuzzy logic Support vector models Genetic algorithms Comprise data mining Data envelopment analysis (DEA)	Entropy theory models Hazard models Credit risk models (CreditMetrics, KMV, CreditPortfolio)

Source: own work based on (Wójcik-Jurkiewicz and Karczewska, 2019) and (Hammond, Opoku and Kwakwa, 2022)

Balcaen and Ooghe (2006) evaluated 43 predictors which were grouped in 4 categories: "1 univariate model, 2 models with risk indices; 21 multiple discriminant analysis models and 19 conditional probability models". Also, Kumar and Ravi (2007), studied 128 statistical and soft computing models to predict the risk of

bankruptcy, focusing on the methods used in various models. Jackson and Wood (2013) discovered 5 commonly used methods as "logit, univariate, multiple discriminant analysis, neural network, and contingent statements". Nevertheless, the ongoing concern predictors studied by now have different levels of precision. And because of this, more research can be made to find various ways of prediction and new models.

Altman (2023) is one of the most famous authors with published research in the field of predicting company bankruptcy, thus he considered that the most used variables for determining the continuity of activity include indicators such as "profitability, liquidity, leverage, solvency, activity and governance variables corporate, varying from one researcher to another in terms of weight and importance". Each researcher uses many variables in his study. The dominant variables are different and can't be fully fixed in a certain set and order. The relative significance of the factors doesn't exist. Thus, it is necessary to analyse and establish the critical independent variables and to be classified in the order of priorities.

The benefit of discriminative models is that they use traditional ratio analysis with econometrics. Moreover, because the results obtained are easy to interpret and the structure is not complicated, the discriminative analysis is the most used method when it comes to detect the risk of insolvency or bankruptcy, worldwide (Holda, 2006).

The going concern assessment faced many threats, which are presented widely in International Standard on Auditing 570. The factors which influence a company can be classified in accordance with many criteria, but the international regulation is distinguishing three main categories when talking about threats: financial, operating and non-financial.

The international regulation highlights only a few situations by way of example, but this does not mean with certainty that the occurrence of these situations will trigger considerable uncertainty. Examples of factors that may lead to doubts about the potential of an entity to continue its activity are presented in Table 2.

Table 2. Factors threatening the going concern assessment.

Classification	Examples
Financial factors	<ul style="list-style-type: none"> • Fixed-term loans that reach maturity without presenting real repayment possibilities. • The constant need to obtain short-term loans in order to finance long-term assets. • Signs of cessation of financing from some debtors or various creditors. • Operating cash flows with negative values reflected by previous or expected financial statements. • Key financial indicators with negative values. • Significant operating losses or substantial impairment of assets expected to generate cash flows. • The impossibility of paying creditors at the established due date.

	<ul style="list-style-type: none"> • The impossibility of respecting the terms stipulated in the loan contracts. • The transition from relationships based on commercial credit, to transactions with cash on delivery, in relation to suppliers.
Operating factors	<ul style="list-style-type: none"> • Loss of an important market, principal supplier license, or others factors. • Work troubles or lack of principal or key goods. • The emergence on the market of another and stronger competitor.
Non-financial factors	<ul style="list-style-type: none"> • Impossibility of compliance with capital requirements or statutory requirements. • Legislative or government policy changes that are anticipated to have negative effects on the going concern assessment. • Absence of reasonable insurance in the event of a disaster.

Source: own work based on (Wójcik-Jurkiewicz and Karczewska, 2019)

3. ALRO S.A. Case study

Discriminant analysis models serve as a means of assessing company's potential to continue its activity in the foreseeable future. ALRO S.A. is a public company listed on BVB (Bucharest Stock Exchange).

In the empirical research of the study, the financial statements of ALRO S.A. were analysed for 10 years, respectively 2012-2022. Thus, three bankruptcy forecasting methods, developed by Hadasik (1998), Gajdka and Stos (1996) and Hamrol and Chodakowski (2008), were applied. The models are detailed in Table 3.

The company was founded in 1961, in Romania it is included in a vertically integrated group, being an aluminium producer, carrying out the entire process, from the extraction of bauxite to obtaining the processed products. I chose this company because after studying the companies listed on the Bucharest Stock Exchange, very few proved to have problems related to the going concern assessment or to face financial distress, and among those identified, I considered ALRO S.A. to be the most relevant, because it is a large company that can make a significant contribution to GDP formation. So that, a possible bankruptcy of it, would significantly impact the market and the industry of which it is a part.

The models described above are in the form of discriminative functions. The critical point for the model of Gajdka and Stos (1996), is set at the level of 0.45, this reflects the idea that if a company generates a result greater than 0.45, its situation is positive, and it is not facing a risk of insolvency or bankruptcy.

Table 3. Models used to determine the values for the models selected for the determination of bankruptcy risk.

Model	Description
Hadasik (1998)	$D(W) = 0,365425W1 - 0,765526W2 - 2,40435W5 + 1,59079W7 + 0,00230258W9 + 0,0127826W12 + 2,36261$
	W1 – current assets / current liabilities W2 – (current assets – inventory) / current liabilities W5 – liabilities / assets W7 – working capital / liabilities W9 – receivables * 365 days / sales revenue W12 – inventory * 365 days / sales revenue
	Critical point: 0,0
Gajdka and Stos (1996)	$Z = 0,7732059 - 0,0856425X1 + 0,0007747X2 + 0,9220985X3 + 0,6535995X4 - 0,594687X5$
	X1 – sales revenue / average annual total assets X2 – average annual see: short-term * 360 / cost of manufacture of product sold X3 – net profit / average annual total assets X4 – gross profit / net sales revenue X5 – total liabilities / net assets
	Critical point: 0,45
Hamrol and Chodakowski (2008)	$Z = 3,562X1 + 1,588X2 + 4,288X3 + 6,719X4 - 2,368$
	X1 – net financial result / total assets X2 – (current assets - inventory) / short-term liabilities X3 – fixed capital / total assets X4 – financial results from sales / sales revenue
	Critical point: 0,0

Source: own work based on Wójcik-Jurkiewicz and Karczewska (2019)

On the other hand, if the value of the result is below the threshold of 0.45, the company faces an unfavorable situation, having a high bankruptcy tax. In the Hadasik (1998) and Hamrol and Chodakowski (2008) models the critical point is set to 0.00. The results generated by the models above, according to the data of ALRO S.A. are presented in Table 4.

Table 4. The results of application the models for the period 2012-2022

Model	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Hadasik (1998)	2,53	2,83	2,36	2,30	2,14	2,34	2,26	2,27	2,19	2,50	2,41
Gajdka and Stos (1996)	-0,01	-0,05	-0,34	-0,23	-0,23	0,31	-0,05	-0,70	-0,06	-0,19	-0,12
Hamrol and Chodakowski (2008)	7,95	7,56	7,30	7,78	7,30	8,85	7,81	7,32	10,18	7,84	8,80

Source: own work based on data from EMIS database (ALRO S.A. financial statements)

According to the financial results of ALRO S.A. reflected in the table above, and in relation with the critical point of Gajdka and Stos's model, it can be deduced that the realised results in 2012 - 2018 reflect clear warnings of an approaching bankruptcy as the values were under the critical point of 0,45. As of 2019, the board of the entity began to put in action diverse solutions pursuing to improve the liquidity, so the value increased to 0.70, but, despite expectations, in the further years, the values decreased below the critical point, again. So according to this model of discriminative function, the company faces a great risk of bankruptcy.

This risk is also reflected by the results acquired through the Hadasik model. The values of the analysed period were around 2, a value near to the critical point. Because of this, the capacity of the company to continue its operations in the foreseeable future is uncertain. The discriminative function in the M. Harmol model crosses the critical point in the analysed period, oscillating around 7, so according to this model, there is no risk of bankruptcy. The most positive outlook regarding going concern assessment, can be observed in 2020, the ratio for this year being at the level of 10.18. In the next years, the ratio fell again. As a conclusion, compared to all three models considered, it can be said that the entity is still facing a risk of financial distress, and the principle of going concern is under threat.

Conclusions

The continuous existence of companies has a major importance for all stakeholders. Researchers continue to develop models for predicting company holdings with a high level of accuracy, but their effectiveness depends on the input data. So, finding the proper variables to reach the intended result, is very important. The accountancy is a tool with which a company can be evaluated and settled in the business environment.

The discriminative analysis is a useful tool when evaluating the principle of going concern and to increase the validity of the economic turnover. This method facilitates the detection of any bankruptcy risk threats in time to enable management to implement actions to improve the company's activities.

Financial analysis is useful for auditors to evaluate the financial situation and highlight potential threats related to the company's economic-financial operations. Based on Micherda and Stępień (2016) "the traditional ratio analyses do not provide uniform results and conclusions even when continued concern is threatened". Thus, discriminant analysis methods facilitate the process of the financial statements' evaluation and the company's ability to continue the activity in normal conditions.

The aspects highlighted in this research contribute to the validation of the research hypothesis mentioned at the beginning of the paper. On cognitive and practical considerations, the discriminatory models were selected for the purpose of evaluating an entity from the point of view of a long-term going concern assessment. This research applied discriminative analysis methods, based on the data of a company from the industrial sector, and it resulted the placement of the company in a threat zone from the point of view of the risk of facing financial difficulties.

Among the paper limitation is the study sample reduced to a single company, a fact that makes it impossible to extrapolate the research results for the entire activity

sector of the analysed entity. But this limitation opens the possibility of future research, based on larger samples and from various fields of activity.

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DIGITAL SKILLS – AN ASSET FOR FUTURE ACCOUNTING PROFESSIONALS. ANALYSIS OF ROMANIA’S POSITIONING WITHIN THE EU MEMBER STATES

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Abstract: *Globalisation, digitisation and technological advances describe the present and future of accounting. In order for accounting professionals to remain always connected to the present and prepared for the future, they constantly need to update their knowledge and skills acquired to date and not hinder their continuous learning process. The focus of this paper is on the digital skills of accounting professionals, which are an imperative in a digital economy. This paper is based on the analysis over time, using mathematical calculation methods, of 5 indicators, which describe the level of information and communication technology skills of the European population. The aim of this analysis is to determine the level of digital skills of the Romanian population in comparison with other EU member countries. Romania, in terms of the 5 indicators, ranks lower in the European ranking. This analysis shows that Romanians, compared to other European populations, use basic digital technologies, are more adaptable in their use, but do not use technologies in a competitive way and do not use them in a more efficient way. For Romania's population to achieve an advanced level of digitisation, they need to develop digital and information skills, digital problem-solving skills, digital communication skills and cybercrime safety skills. These skills must be mandatory in the knowledge portfolio of accounting professionals. These are the most current requirements of financial jobs. Accounting professionals must comply with the new requirements of the digital economy which is extending to all fields of activity, such as social relations, health, public administration.*

Keywords: digitalization, digital skills, information skills, digital communication, digital security, accounting profession

JEL classification: M41

1. Background

The Digital Economy Initiative for Latin America and the Caribbean (The World Bank, 2018) identified six pillars of the digital economy framework:

- *digital infrastructure* involves connectivity, including: high-speed internet access, mobile devices, computing, sensors, voice-activated devices, geospatial tools, vehicle-to-vehicle communications and data devices, data centres and clouds;

- *digital skills* support innovation. Digital skills include both technological and business skills, setting up and managing a digital entity;
- *digital platforms* support data exchange, transactions and access to public and private digital services. They play an intermediary role between two or more players involved in digital transactions;
- *digital financial services* remove geographical and market barriers;
- *digital business* stimulates employment and innovation;
- *the trusted environment* requires a governance framework that balances data protection factors and supports digitisation. Strengthening data protection regulations, cyber security capabilities and digital identification system is essential for people to improve their trust in digital transactions.

The European Union defines the digital decade as the period from 2020 to 2030. According to the Digital Agenda (European Commission, 2021), among the major targets to be achieved by 2030 is the threshold of 80% of adults having basic digital skills. The Digital Europe Programme (European Commission, 2021) is a funding programme for the implementation of digital technologies. Supercomputing, artificial intelligence, cyber security, advanced digital skills and ensuring widespread use of digital technologies across the economy and society are the 5 areas supported financially by this programme.

The European Commission (European Commission, 2018) has designed a framework, called DigComp (The Digital Competence Framework for Citizens), of digital competence for citizens. DigComp is an important tool to support the EU Action Plan on Digital Education 2021-2027 (Commission, 2020), which in turn supports the European Commission's priority of A Digital Europe. This framework is structured into five areas, which are graphically represented in Figure 1.

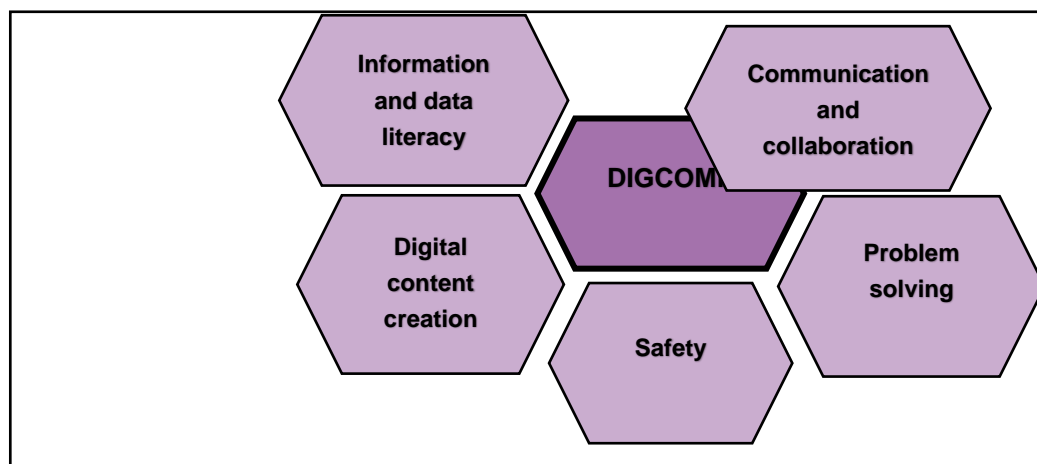


Figure 1: DigComp Framework

Source: processing according to European Commission, 2018

Digital and information literacy is about identifying information needs, location and access to data, source and content relevance analysis, storage and management of digital content data.

Communication and collaboration involves interaction through digital technologies, citizen participation through digital public services, including digital private services, and managing their own digital identity.

Digital content creation involves creating, editing and integrating information into a knowledge base or information system, while respecting copyright.

Safety is the protection of devices, content and personal data in digital environments.

Problem solving includes the solution of conceptual problems that occur in the digital environment. This domain keeps up to date with digital developments as it uses innovative digital tools.

Current technical advances due to the use of computers have changed the accountant's work in terms of methodology and principles, and having digital skills is an imperative.

2. Literature review

Kushakov (2022) notes a number of issues that need to be solved before the digital economy implementation process can start. These include: low levels of digital literacy among the population, lack of infrastructure, lack of specialists in the field, tradition-based consciousness and lack of cyber security. These impediments do not allow the correct implementation of digital technologies which in the future may create unfavourable consequences for economic activities.

Following a systematic literature review conducted (Ferreira C., 2021) on the Web of Science database for the period 2015-2020, researchers found that for accounting professionals, digital skills play a significant role in the development and exploitation of technologies at the level of economic entities. Şova (2016) is of the opinion that certain skills are indispensable for accounting professionals in the conditions generated by the digital economy, such as: data mining tools in the business intelligence mining process, tools that support data analysis and modelling, management skills, digital skills and knowledge in the field of cyber security.

Most accounting professionals see digital technology and the transformation of the profession as a threat to the human being. We see this threat as a result of low levels of digital skills, knowledge of information technology systems and lack of interaction with IT applications. Guşel and Mangiuc (2022) found, following a study of curricula published on the websites of four major Romanian universities, that accounting education needs to be rethought. The accounting education curricula must contain subjects that present and allow interaction with digital technologies such as cloud, big data, blockchain to develop digital skills and promote interaction with various software. The role of the education system is to support evolution.

The fact that digital technology is not treated as a privileged subject in accounting curricula is also confirmed by the survey of 1161 accounting professionals from 112 United Kingdom and Northern Ireland universities (Kotb, et al., 2019). Technological developments and digital skills are a relevant area for accounting education curricula.

Digital competences (Vuorikari, et al., 2022) involve the confident and responsible competitive use of digital technologies for efficient work and active participation in society. Accounting professionals need to implement digital

technologies in order to reduce time spent on repetitive tasks and manual work in favour of financial advisory activities. Digital skills are the catalyst for transforming accounting professionals from manipulators of numbers to interpreters of financial statements.

3. Database and methodology

This study is focused on the analysis over time of five indicators describing the level of information and communication technology skills of the European population. This study is quantitative research. The method used is a mathematical method for calculating the extreme minimum and maximum points in the range of values of the selected indicators. The main objective of the research is to analyse the level of information and communication technology skills of the Romanian population at EU level. The research is based on the following hypotheses:

H₁- The Romanian population has digital skills. Romanians know how to use a spreadsheet or text processing software.

H₂- The Romanian population has information skills. Romanians have adapted to online news and digital newspapers.

H₃- The Romanian population has digital communication skills. Romanians know how to use e-mail and prefer internet conversations over face-to-face meetings.

H₄- The Romanian population doesn't have any skills in digital problem solving. Romanians make purchases online but don't look for a job on digital platforms.

H₅- The Romanian population doesn't have digital security skills. Romanians don't know how to manage access to confidential personal data.

For the analysis of the level of digital skills of the Romanian population in comparison with other EU member countries, we used the information provided by Eurostat - the statistical body of the European Commission - from the general archive on digital skills. These data were collected from the population aged 16 to 74 in the European Union. For most of the countries, the final sample size was between 3000 and 6000 participants. The digital competence indicators selected and analysed over the period 2015-2021 as follows:

- the percentage of the population with digital skills in the survey population aged 16-74 (Appendix 1);
- the percentage of the population with information skills in the population surveyed aged 16-74 (Appendix 1);
- the percentage of population with digital communication skills in the population surveyed aged 16-74 (Appendix 1);
- the percentage of population with digital problem-solving skills in the survey population aged 16-74 (Appendix 2);
- the percentage of population with digital security skills in the survey population aged 16-74 (Appendix 2).

Indicators are expressed in percentages and represent the percentage of the population with digital skills in the total population surveyed. In the annexes, we have highlighted the average values of the indicators calculated at EU level for 28 member countries in the period 2013-2020 and 27 member countries from 2020 respectively.

4. Results

The tables below represent a selection from Appendix 1 and 2 of the minimum and maximum values for each period, and Romania as well where this is necessary. In these tables were selected four values above the average and four below the EU average. In the following tables the EU average is highlighted in yellow, the maximum values are highlighted in red and the minimum values in green. If Romania's population records values between the maximum and minimum levels, then Romania is identified by the blue colour.

- *The percentage of population with digital skills*

In order to study the percentage of population with digital skills, we have extracted information from Eurostat. This information is presented in extenso in Annex 1, from which we have selected only some of the countries presented in Table 1.

The activities analysed in the calculation of digital skills are:

- use of word processing software;
- use of an application/spreadsheet;
- editing photos, video or audio files;
- copying or moving files between folders, devices or to the cloud;
- creating files that include more than one element, such as text, image, table, graphic, animation or sound;
- using advanced software/worksheet functions to organise, analyse, structure or modify data;
- writing code in a programming language.

The baseline level of this indicator is identified by performing maximum two of the activities listed above. The values of this indicator are shown in Table 1.

Table 1. The percentage of population with digital skills

	Period	2015	2016	2017	2019	2021
Country						
Sweden		36,35	29,84	30,83	26,38	22,11
Germany		31,42	34,06	31,46	31,32	25,40
Czech Republic		33,97	33,38	35,78	36,30	22,22
Slovakia		27,07	26,14	25,95	26,80	29,04
EU average - 27 countries (from 2020)		27,05	27,03	26,21	25,00	20,93
EU average - 28 countries (2013-2020)		27,09	26,85	26,00	25,01	X
Romania		17,30	19,06	18,90	20,64	18,76
Bulgaria		18,46	16,17	18,44	18,11	21,36
Malta		18,14	17,66	17,90	17,56	22,83
Portugal		19,75	19,31	19,51	19,66	16,43

Source: <https://ec.europa.eu/eurostat>

Based on the data in Table 1 we can see that in the period 2015-2021 countries such as Sweden, Germany, the Czech Republic and Slovakia have the highest percentages of the population with digital skills. These countries exceed the EU average, while Romania, Bulgaria, Malta and Portugal have the lowest percentages of this indicator. This means that we have twice as few people doing two or less of the activities taken into account in the calculation of digital skills than Sweden, Germany, the Czech Republic and Slovakia. Romania's lower than EU average result reflects the lack of involvement of the population in the provision of education and training, the lack of up-to-date information and communication technology skills and the lack of interest in adapting to changing circumstances.

- *The percentage of population with informational skills*

In order to study the percentage of population with informational skills we have extracted the information provided by Eurostat. This information is presented in extenso in Appendix 1, from which we have selected only a few countries shown in Table 2.

Table 2. The percentage of population with informational skills

PERIOD						-%
Country	2015	2016	2017	2019	2021	
Poland	14,12	11,93	12,64	12,76	11,35	
Italy	13,04	14,63	X	14,19	12,99	
Romania	12,47	12,77	15,79	20,84	17,31	
EU average - 27 countries (from 2020)	9,83	9,80	9,76	10,15	12,12	
EU average - 28 countries (2013-2020)	9,94	9,97	9,81	9,81	X	
Finland	5,71	5,62	5,23	4,43	3,41	
Croatia	6,47	4,28	4,81	5,32	3,48	
Netherlands	5,95	4,93	4,03	4,36	3,99	

Source: <https://ec.europa.eu/eurostat>

The activities analysed for calculating informational skills are:

- searching for information about goods and services;
- searching for health-related information;
- reading online news and digital newspapers;
- checking online information and its sources.

The baseline level of this indicator is identified by performing at least one of the activities listed above. The values of this indicator are presented in Table 2.

The data presented in Table 2 shows that Romania is at the top of the ranking for the percentage of the population with information skills in 2017-2021. It should be noted that Romania recorded values above the EU average, which means that Romanians have performed at least one activity of searching or checking information online. This reflects a significant degree of adaptability to the circumstances of the digital age. In 2015-2016, the leaders in the ranking were Poland and Italy. The lowest values of this indicator are reported for Finland, Croatia and the Netherlands.

▪ *The percentage of population with digital communication skills*

In order to study the percentage of population with digital communication skills we have extracted information from Eurostat. This information is presented in extenso in Appendix 1, from which we have selected only a few countries shown in Table 3.

Table 3. The percentage of population with digital communication skills

	-%-				
PERIOD	2015	2016	2017	2019	2021
Country					
France	28.67	28.60	27.20	25.64	14.06
EU average - 27 countries (from 2020)	18.86	20.12	18.13	16.79	8.80
EU average - 28 countries (2013-2020)	18.49	19.29	17.56	16.41	X
Romania	10.36	14.50	11.65	15.92	12.12
Bulgaria	7.10	8.71	8.02	10.98	7.48
Malta	12.74	11.00	7.92	10.41	2.71
Hungary	8.34	9.89	8.29	7.37	4.10
Netherlands	18.16	16.69	13.74	11.27	1.58

Source: <https://ec.europa.eu/eurostat>

The activities included in the calculation of communication and collaboration skills are:

- sending and receiving e-mails;
- phone calls and video call on the Internet;
- participation on social networks;
- expressing opinions on civic or political issues on websites or social media;
- participating in online consultations or voting to identify and resolve civic or political issues.

The baseline level of this indicator is identified by performing at least one of the activities listed above. The values of this indicator are presented in Table 3.

The data in Table 3 identifies France at the top of the ranking, with the highest percentage of the population having digital communication and collaboration skills in all years from 2017-2021. Romania, in the period 2015-2019 ranks below the EU average, and in 2021 it advances above the EU average. This advance reflects an adaptability of Romanians to virtual life, digital conversations and active engagement as digital citizens. The countries with the lowest percentage of population with digital communication skills are Bulgaria, Malta, Hungary and the Netherlands.

▪ *The percentage of population with digital problem-solving skills*

In order to study the percentage of people with digital problem-solving skills we have extracted information from Eurostat. This information is presented in extenso in Appendix 2, from which we have selected only a few countries shown in Table 4.

The activities used in the calculation of digital problem-solving skills are:

- downloading or installing software or applications;
- changing the settings of a software or application;
- making online purchases (in the last 12 months);
- selling online;
- using online learning resources;
- internet banking;
- looking for a job or applying for a job online.

The baseline level of this indicator is identified by performing a maximum of two of the activities listed above. The values of this indicator are shown in Table 4.

Table 4. The percentage of population with digital problem-solving skills

PERIOD	2015	2016	2017	2019	2021
Country					
Romania	29,13	36,53	35,43	40,07	32,77
Germany	16,92	16,72	17,42	14,74	38,13
EU average - 27 countries (from 2020)	19,07	19,74	19,62	19,91	26,54
EU average - 28 countries (2013-2020)	19,36	19,88	19,55	19,29	X
Sweden	12,58	14,80	16,39	18,05	18,39
Luxemburg	14,67	12,42	13,21	24,43	24,93
Latvia	18,91	15,44	12,35	26,56	31,85
Netherlands	16,13	13,90	14,36	13,36	10,29

Source: <https://ec.europa.eu/eurostat>

The values reflected in Table 4 identify Romania with the highest percentage of the population with digital problem-solving skills between 2015 and 2019. The positive aspect of this position is given by the fact that the leading position in the ranking has been kept for four years. However, in 2021 this position is occupied by Germany. Below the EU average and with low percentage of the population with digital problem-solving skills are Sweden, Luxembourg, Latvia and the Netherlands.

- *The percentage of population with digital security skills*

In order to study the percentage of population with digital security skills we have extracted information from Eurostat. This information is presented in extenso in Appendix 2, from which we have selected only a few countries shown in Table 5.

Table 5. The percentage of population with digital security skills

PERIOD	2015	2016	2017	2019	2021
Country					
Sweden	31.99	24.28	25.63	22.59	29.61
Czech Republic	26.99	28.42	31.95	34.44	31.35
Luxembourg	17.16	21.07	19.82	21.33	34.01

EU average - 27 countries (from 2020)	19.30	19.08	19.39	19.24	24.36
EU average - 28 countries (2013-2020)	19.36	19.12	19.25	19.21	
Romania	13.86	14.82	15.82	19.84	26.34
Croatia	9.91	15.67	16.80	12.90	23.65
Portugal	12.41	11.75	12.00	13.25	16.35
Malta	12.83	13.99	14.36	12.62	20.77
Netherlands	22.77	25.23	25.89	24.89	15.53

Source: <https://ec.europa.eu/eurostat>

The activities analysed in the calculation of digital security skills are:

- managing access to personal data by verifying that the website where the respondent has provided data is secure;
- managing access to personal data by reading privacy statements before providing personal data;
- managing access to personal data by restricting or denying access to personal data at personal geographical location;
- managing access to personal data by limiting access to your profile or content on social media or storage sites;
- managing access to personal data by refusing to allow the use of personal data for advertising purposes;
- modifying the settings in personal internet browser to limit cookies on any of the respondent's devices.

The baseline level of this indicator is identified by performing maximum two of the activities listed above. The values of this indicator are shown in Table 5.

Based on the data in Table 5, it shows that the highest percentage of the population with digital security skills is in Sweden, the Czech Republic and Luxembourg. Romania is below the EU average, but does not have the lowest values. The lowest values are recorded for Croatia, Portugal, Malta and the Netherlands. Digital security is an important element in the digital economy.

5. Conclusions

In our opinion, Romania, based on the analysed skills, has a lower ranking in the ranking of EU countries. In the period 2015-2021, the percentage of Romania's population with digital skills, digital communication skills and digital security skills was below the EU average. In contrast, the percentage of Romania's population with information and digital problem-solving skills was above the EU average. This highlights the fact that Romanians use digital technologies responsibly, but not competitively. Adaptability is developing among Romanians, but digital technologies are not used to make work and society more efficient.

The results of the research are presented in Figure 2 by validating hypotheses 2 and 5 and not validating research hypotheses 1, 2 and 3.






RESEARCH RESULTS		
Hypothesis 1	<i>The Romanian population has digital skills. Romanians know how to use a spreadsheet or text processing software.</i>	
Hypothesis 2	<i>The Romanian population has information skills. Romanians have adapted to online news and digital newspapers.</i>	
Hypothesis 3	<i>The Romanian population has digital communication skills. Romanians know how to use e-mail and prefer internet conversations over face-to-face meetings.</i>	
Hypothesis 4	<i>The Romanian population doesn't have any skills in digital problem solving. Romanians make purchases online but don't look for a job on digital platforms.</i>	
Hypothesis 5	<i>The Romanian population doesn't have digital security skills. Romanians don't know how to manage access to confidential personal data.</i>	

Figure 2: Research results

Source: processing the results of the study

Research results show that the Romanian population has poorly developed digital skills, as very few Romanians use a spreadsheet and word processing software. The Romanian population does not perform at least one of the activities related to digital skills. At the same time, they have weak digital communication skills. Romanians, even if they use and own an e-mail address, prefer physical meetings with protocol costs instead of internet conversations without travel costs. Romanians are also poorly skilled in digital security. Romanians do not know how to manage access to their own private data, how to change their browser settings to limit cookies or how to refuse geographic location sharing.

Instead, Romanians have digital problem-solving skills. They know how to install apps, have made online transactions, are looking for a job on a digital platform and use internet banking services. In terms of information skills, the Romanian population exceeds the EU average, which means that Romanians use the internet for information purposes and have replaced physical newspapers with digital news.

In our opinion, even though the digital skills analysed on the basis of the following activities: use of word processing software, use of an excel spreadsheet and use to edit photos or video files, are provided in the higher education system and taught in Romanian universities, they do not seem to be the strong point of graduates. The shortcomings of the educational system may be due to the lack of practical classes in which students can apply and determine the usefulness of these applications, the presentation of old-fashioned and irrelevant applications for purely informative purposes, or the lack of involvement of students and teachers in the educational process.

We believe that it is necessary and useful for any educational establishment to be equipped with electronic devices and up-to-date licensed applications to operate text processing or spreadsheet processing software. Digital skills are a determining factor in employment, and this should not be neglected in the education system. Digital skills in the digital economy belong to the category of general knowledge.

The digital skills required for an accounting professional need to exceed the basic level as they interact with advanced digital technologies. Accounting professionals must be proficient and have advanced knowledge and skills in using word processing software, an application/spreadsheet, using advanced functions of a software/worksheet to organise, analyse, structure or modify data, copying or moving files between folders, devices or to the cloud, sending and receiving emails, downloading or installing software or applications, using internet banking and many other services.

The present accounting offers technologies such as digital signature, virtual private space, cloud accounting, software robots, machine learning, SAF-T, e-Invoicing. The range of digital tools directly addressed to accounting professionals is constantly developing. The implementation of these tools is closely linked to the ability of accounting professionals to exploit digital technologies, the ability to continuously learn about the new technologies, testing to determine how to improve the applications and efficient implementation in the economic and financial activities of economic entities.

The limitations of this study are due to the small number of indicators, the short period of time analysed, the missing data from the Eurostat database, the sample selected in the questionnaires.

There is a clear need for further research in terms of determining the level of digital skills of accounting professionals, the causes hindering the development of these skills, addressing the development of digital skills in the educational context for accounting professionals, the relationship between accounting professionals and innovation.

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APPENDIX 1.

TIME	2015	2016	2017	2019	2021	2015	2016	2017	2019	2021	2015	2016	2017	2019	2021
GEO (Labels)	Percentage of population with digital skills					Percentage of population with informational skills					Percentage of population with digital communication skills				
European Union - 27 countries (from 2020)		27.03	26.21	25	20.93	9.83	9.8	9.76	10.15	12.12	18.86	20.12	18.13	16.79	8.8
European Union - 28 countries (2013-2020)	27.09	26.85	26	25.01		9.94	9.97	9.81	9.81		18.49	19.29	17.56	16.41	
Belgium	29.16	29.37	29.57	26.65	19.13	11.46	10.53	10.58	10.98	14.13	14.18	12.98	12.68	10.51	10.34
Bulgaria	18.46	16.17	18.44	18.11	21.36	10.74	12.34	11.53	12.63	14.3	7.1	8.71	8.02	10.98	7.48
Czechia	33.97	33.38	35.78	36.3	22.22	11.06	9.26	7.44	7.6	6.5	25.64	23.1	23.06	17.92	8.94
Denmark	26.45	24.59	23.98	21.46	21.03	5.88	5.57	5.4	4.89	7.58	16.48	13.9	15.19	10.06	4.72
Germany	31.42	34.06	31.46	31.32	25.4	5.85	6.85	6.78	6.52	17.29	20.71	26.65	20.13	18.72	13.63
Estonia	27.07	25.57	25.47	24.55	21.03	6.15	6.81	7.4	5.88	7.05	16.46	16.56	14.77	13.72	8.74
Ireland	19.37	19.39	19.9	19.24	21.01	13.39	13.07	12.62	9.75	8.96	17.3	16.75	15.13	15.33	5.69
Greece	27.91	26.49	24.49	27.2	21.74	6.79	6.19	5.51	5.02	6.27	15.01	12.75	11.63	11.04	5.47
Spain	23.87	22.63	23.16	21.11	21.17	8.97	8.11	9.13	9.43	8.64	17.55	18.09	17.5	16.72	4.5
France	29.93	28.08	27.89	26.38	21.11	12.36	12.66	11.69	12.62	14.8	28.67	28.6	27.2	25.64	14.06
Croatia	20.63	21.33	20.31	18.01	16.83	6.47	4.28	4.81	5.32	3.48	14.46	12.28	10.6	13.58	3.8
Italy	23.98	24.17	:	19.49	16.86	13.04	14.63	:	14.19	12.99	17.52	18.17	18.16	15.55	4.53
Cyprus	27.19	22.48	31.67	19.79	16.96	8.62	8.83	9.09	8.23	3.89	9.5	9.2	9.12	8.71	2.65
Latvia	23.66	23.73	21.27	18.51	24.45	7.33	6.12	6.24	10.39	12.9	11.49	13.14	13.52	12.68	6.84
Lithuania	20.95	22.45	22.85	23.85	18.74	6.83	8.53	7.59	6.71	6.85	11.28	10.94	10.9	10.99	6.14
Luxembourg	30.32	31.99	29.93	28.83	25.33	7.65	5.05	6.16	13.2	15.08	15.55	16.56	13.86	19.83	13.82
Hungary	27.1	27.54	23.84	23.32	20.66	5.91	6.94	6.56	6.39	5.55	8.34	9.89	8.29	7.37	4.1
Malta	18.14	17.66	17.9	17.56	22.83	7.08	7.27	6.43	8.55	4.88	12.74	11	7.92	10.41	2.71
Netherlands	29.91	31.64	31.65	29.81	18.46	5.95	4.93	4.03	4.36	3.99	18.16	16.69	13.74	11.27	1.58
Austria	31.21	30.86	31.23	26.33	19.24	9.34	7.4	9.36	8.53	11.2	22.35	23.63	23	18.34	5.21
Poland	24.98	25.02	25.25	23.16	19.81	14.12	11.93	12.64	12.76	11.35	17.19	17.72	16.32	15.18	9.89
Portugal	19.75	19.31	19.51	19.66	16.43	7.52	6.66	6.7	7.04	6.18	11.61	12.1	11.61	10.74	3.77
Romania	17.3	19.06	18.9	20.64	18.76	12.47	12.77	15.79	20.84	17.31	10.36	14.5	11.65	15.92	12.12
Slovenia	25.28	25.14	24.31	24.06	25.87	7.63	7.46	7.46	9.63	10.68	20.69	20.61	19.67	19.54	9.74
Slovakia	27.07	26.14	25.95	26.8	29.04	9.56	9.53	9.04	9.59	11.47	14.86	14.71	14.1	14.04	9.71
Finland	33.04	29.31	30.32	26.4	19.03	5.71	5.62	5.23	4.43	3.41	22.77	21.03	18.16	12.78	4.93
Sweden	36.35	29.84	30.83	26.38	22.11	8.55	6.67	6.95	6.07	8.77	16.2	15.02	15.16	12.84	8.25
United Kingdom	27.41	25.66	24.53	25.04		10.83	11.13	10.17	7.49		15.71	13.51	13.63	13.79	

Max	36.35	34.06	35.78	36.3	29.04	14.12	14.63	15.79	20.84	17.31	28.67	28.6	27.2	25.64	14.06
Min	17.3	16.17	17.9	17.56	16.43	5.71	4.28	4.03	4.36	3.41	7.1	8.71	7.92	7.37	1.58

APPENDIX 2.

TIME	2015	2016	2017	2019	2021	2015	2016	2017	2019	2021
GEO (Labels)	Percentage of people with digital problem-solving skills					Percentage of people with digital security skills				
European Union - 27 countries (from 2020)	19.07	19.74	19.62	19.91	26.54	19.3	19.08	19.39	19.24	24.36
European Union - 28 countries (2013-2020)	19.36	19.88	19.55	19.29		19.36	19.12	19.25	19.21	
Belgium	20.67	21.42	22.03	21.31	29.56	24.76	25.67	25.11	23.29	25.91
Bulgaria	20.87	21.57	25.78	24.81	28.33	13.3	12.68	13.7	14.32	30.72
Czechia	21.64	22.61	16.76	16.72	33.55	26.99	28.42	31.95	34.44	31.35
Denmark	14.24	16.84	25.2	22.03	16.49	19.48	17.45	17.58	15.59	25.94
Germany	16.92	16.72	17.42	14.74	38.13	22.4	22.92	22.37	23.43	29.25
Estonia	21.82	24.31	21.81	18.82	23.56	19.37	18.37	20.07	20.19	25.92
Ireland	25.62	28.02	24.94	26.99	21.15	14.31	14.44	15.2	13.45	23.58
Greece	23.55	20.77	21.24	20.4	26.74	22.74	23.81	20.53	23.09	24.65
Spain	18.25	17.5	17.13	18.26	21.66	15.38	14.61	16.05	15.59	17.98
France	18.75	21.18	20.44	20.97	23.27	20.22	17.87	18.71	18.49	23.97
Croatia	15.96	16.41	17.38	17.22	20.49	9.91	15.67	16.8	12.9	23.65
Italy	19.81	20.79		20.89	22.35	14.11	14.5		13.17	23.85
Cyprus	25.05	21.68	23.77	21.03	24.7	23.97	18.57	30.52	15.91	28.62
Latvia	18.91	15.44	12.35	26.56	31.85	20.47	20.78	17.26	14.74	23.37
Lithuania	14.08	15.02	15.6	15.65	24.95	17.45	20.32	20.79	22.46	24.51
Luxembourg	14.67	12.42	13.21	24.43	24.93	17.16	21.07	19.82	21.33	34.01
Hungary	19.86	24.17	21.23	23.53	27.55	23.8	22.94	20.31	18.5	30.94
Malta	15.18	14.97	15.56	18.49	18.74	12.83	13.99	14.36	12.62	20.77
Netherlands	16.13	13.9	14.36	13.36	10.29	22.77	25.23	25.89	24.89	15.53
Austria	16.99	15.46	16.46	14.98	22.68	21.43	20.12	21.07	18	25.59
Poland	20.46	19.75	19.47	22.61	27.68	19.76	19.89	20.07	19.57	19.64
Portugal	17	16.61	17.02	18.25	27.06	12.41	11.75	12	13.25	16.35
Romania	29.13	36.53	35.43	40.07	32.77	13.86	14.82	15.82	19.84	26.34
Slovenia	20.01	17.35	17.84	20.17	27.28	14.27	16.56	15.74	15.9	30.24
Slovakia	17.31	17.99	16.81	17.31	28.62	22.53	22.48	22.17	23.32	32.69
Finland	18.04	16.49	15.99	16.58	15.83	23.99	23.76	24.96	21.9	23.35
Sweden	12.58	14.8	16.39	18.05	18.39	31.99	24.28	25.63	22.59	29.61
United Kingdom	21.56	20.85	19.08	15.02		19.89	19.41	18.32	18.99	
Max	29.13	36.53	35.43	40.07	38.13	31.99	28.42	31.95	34.44	34.01
Min	12.58	12.42	12.35	13.36	10.29	9.91	11.75	12	12.62	15.53

EXPLORING THE DIGITAL LANDSCAPE: STUDENT PERSPECTIVES ON THE FUTURE OF ACCOUNTING

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Abstract: The goal of this paper is to better comprehend the importance of digitalisation related to Romanian accounting profession. In this regard we started by reviewing the scientific papers approaching the digitalisation and artificial intelligence topic in accounting field. Then we conducted an empirical study that analyses students' behavior when dealing with digitalisation in accounting field, having as main objective to illustrate both the positive and negative aspects perceived by students regarding the digitalisation of the financial-accounting field, especially the accounting profession. The empirical research was carried out between April 2023 and May 2023, and the research method used was the survey, the instrument used being the questionnaire. This has been fulfilled by 118 *at the bachelor level* students in the accounting field from the Faculties of Economics, within the University of Oradea. This paper is going to validate the different importance given to digitalisation, by accounting professionals in Romania. The research questions that this study aims to answer are: *How necessary do they consider specialized courses in digitalizing accounting to prepare them for the changes brought about by this process? What are their preferences regarding teaching methods in accounting digitalisation courses: online, onsite, or in a hybrid format?* A significant part of those surveyed considers that *the positive effects of digitalisation in accounting include reducing waiting times, increasing work efficiency, facilitating access to information, and reducing paper consumption. However, there are also negative aspects, such as the risk of data loss due to technical issues or security breaches. To maximize the benefits and minimize the risks, it is essential for accountants to understand and apply accounting principles and standards correctly. Digitalisation should complement, not replace, professional judgment.*

Keywords: accounting, digitalisation, accounting software, technology

JEL Classification: M41, M49, Q55

1. Introduction

Will human work be replaceable by a robot? Starting from this question, we aim to analyze how the accounting profession will evolve in the context of the new challenges posed by digitalisation. In this regard, by the end of the research, we aim

to achieve the following objectives: to gain an overview of how the accounting profession can be affected by digitalisation, to explore how artificial intelligence can be utilized in accounting, to present the programs and systems used in the accounting of small, medium, and large entities, to analyze students' perception of digitalisation in the accounting profession, and to determine the main challenges and opportunities encountered by accounting professionals following the process of professional digitalisation.

The paper is organized in the following manner: the initial section focuses on specialized literature, the viewpoints, and findings of both Romanian and international authors, with the aim of establishing a comprehensive theoretical foundation pertaining to the subject matter. The study proceeds with the presentation of the employed methodology and the description of the analyzed sample. The results are both presented and deliberated upon within the third section. The closing section provides a concise summary of the primary conclusions drawn

2. Literature review

Over time, global changes have underscored the necessity of maintaining accounting records. Whether upheld through traditional means or in a digital format, accounting serves as an indispensable source when it comes to decision-making within an entity (Boghian and Socoliuc, 2020). According to the insights of Melega et al (2021) the present era necessitates the digitalisation of accounting and its smooth integration into an enterprise's information system. This transformative information system aims to augment the enterprise's performance, bolster its competitive edge, and redefine accounting as the 'art' that is integral to securing the enterprise's success. A pivotal facet of accounting digitalisation involves consolidating accounting data within a unified information system, seamlessly intertwined with real-world operations.

Artificial Intelligence (AI) comes to the aid of accounting professionals, relieving them from routine tasks such as invoice and receipt processing, centralizing numbering processes, providing insights into expenditures, revenues, and much more. This transformation redefines the accountant's role, shifting them from mere book-keeping to a decision-making consultant for their clients (Johnson, 2023).

Artificial intelligence is the scholarly discipline focused on the technical expertise required to develop computers and software that exhibit intelligent and superior capabilities compared to humans (Elaine, 2020).

Organizations have undergone a transformation in their managerial processes, the industrial sector has witnessed the modernization of production methods, and individuals have evolved in their modes of interaction, purchasing, negotiation, and engagement with technology. Accounting, when viewed from an integrated standpoint, functions as an integral element within an organizational information system. Present-day information systems represent the culmination of years of technological and procedural advancement. Guerrero and Sierra (2018) have delineated six tiers of information system evolution:

Level 1—Transactional—Summary reports, ERPs

Level 2—Tactical—Consolidated Reports, Excel, Access

Level 3—Analytical—Analytical Tools, KPIs, Datamart, User access

Level 4—Strategic—Predictive modelling, Dashboards, Data governance, Wide user access

Level 5—Advanced—Real-time, Advanced analysis, Scorecards, Automation, Forecast, Decision X, Events, Corporate DW, Corporate KPIs, Business, Government

Level 6—Innovative—Globalised corporate process, Analytical services, Enterprise data warehouse, Collaborative asset.

Some study focuses on examining the impact of information about digitalisation provided by companies through their websites on their value. Orens et al. (2009) and Salvi et al. (2020) carried out an assessment of information closely linked to digitalisation, revealing a favorable influence of data pertaining to intellectual capital on a company's value. Recent scholarly research has explored the consequences of digitalisation. In alignment with the goals of this study, the literature review places particular emphasis on the financial ramifications of digitalisation. Several studies have indicated that it constitutes a pivotal factor in a firm's performance (Khanom 2017, Bellakhal & Mouelhi, 2020, Junkroski, 2023; Pillans, 2023).

According to Salvi et al. 2020, regression analysis conducted on a sample of 114 international companies revealed a positive relationship, suggesting that information about digitalisation can contribute to increasing the value of these companies.

Some studies highlight the pivotal role of digitalisation in shaping organizational performance and social perceptions. Martín-Peña et al. (2019) noted that digitalisation acts as a beneficial mediator in the connection between servitization and firm performance. Meanwhile, Bota et al. (2023) investigates the influence of digitalisation on the perception of corruption. In both scenarios, digitalisation plays a substantial role in the progression of organizations and the attainment of improved outcomes. A study conducted by Ionascu and Anghel in 2020 is centered on the significance of transparency in sustainability reporting for real estate entities and the integration of digital technology. It reveals that transparency is primarily linked to corporate governance, with REITs leading in this aspect. The utilization of digital technology holds the potential to enhance transparency and market efficiency, resulting in reduced transaction costs and advantageous outcomes for investment asset values.

A study addressing the incipient impact of digitalisation on the Romanian accounting profession, conducted by Mălăescu and Avram (2018), highlights the crucial role of technological factors, particularly information and communication technology (ICT), in shaping this profession's transformation. Through our current study, we also aim to capture the importance of digitalisation in the context of the Romanian accounting profession.

3. Research methodology

The primary aim of this study is to investigate the perspectives of undergraduate students at the University of Oradea, Romania, regarding the significance of digitalisation in relation to the Romanian accounting profession. To accomplish this goal, an exploratory research approach was employed, involving a cross-sectional descriptive research design and utilizing a survey as the research method. The

research instrument utilized was a questionnaire, which comprised two distinct categories of inquiries: general questions intended to offer a comprehensive understanding of the personal characteristics of the study's participants, and specific questions focused on the participants' perceptions of digitalisation, with consideration for their professional backgrounds. Our survey was carried out between April-May 2023 and it constitutes the basis for substantiating the scientific approach. Our sample consists of accounting and finance bachelor students' in one of the Romanian representative universities. We will use a descriptive analysis of the answers provided by the sample subjects.

The total population under analysis is represented by the 118 bachelor students the University of Oradea Faculty of Economics.

4. Data analysis

To analyze the responses provided by the students, we constructed one-dimensional tables (based on a single variable) and cross-tabulation tables, where we presented both the absolute and relative frequencies of the answers at the sample level. The survey encompasses two question categories: general inquiries aimed at portraying an accurate depiction of the students' personal profiles, and inquiries pertaining to their perception of the presence and expressions of the digitalisation phenomenon within the Romanian accounting profession. Guided by a meticulous methodological approach, the survey was purposefully designed to navigate two distinct question categories:

Student Profile Overview

The initial overarching point elucidated through the survey questions is the categorization of students based on their gender.

Table 1: Distribution of respondents in the sample of students according to gender

Answer choices	Simple absolute frequencies	Simple relative frequencies
Female	96	81.36%
Male	22	18.64%
Total	118	100%

Source: Own elaboration based on questionnaire responses

Following the analysis of the questionnaire data, it is evident that individuals of the female gender exhibit a significantly higher level of interest in the digitalisation of the financial and accounting domain, with a rate of 81.36%, in contrast to male individuals, who register a rate of only 18.64%. This phenomenon aligns with the trends observed in practical scenarios.

Regarding specialization and year of study, it is observed in the figure 1 that the majority of respondents are enrolled in the CIG study program, comprising 29.66% in the first year, 16.95% in the second year, and 24.58% in the third year. Additionally, students in the FB study program represent the following percentages: 6.78% in the first year, 10.17% in the second year, and 11.86% in the third year.

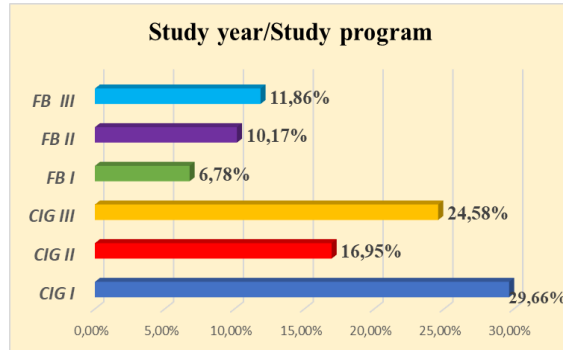


Figure 1: Student Distribution by Program and Year

Source: Own elaboration based on questionnaire responses

Based on empirical research findings, it is noteworthy that only 21,19% of the students are currently employed within the financial accounting field, and these individuals are primarily in their second and third years of study. Consequently, in the subsequent responses, we shall consider both the perspectives of students who are actively working in this domain and those who have not yet entered the labor market.

Specific Aspects Regarding Students' Perception of the Challenges and Opportunities of Digitalisation in the Accounting Profession

Regarding students' academic preparation for their future profession, they hold the perception that their university education is considered adequate by 54.24% of them to meet the challenges in their prospective workplaces, while the remaining 45.76% find their academic training to be insufficient. As illustrated in Figure 2, it is evident that the results exhibit closely aligned values.

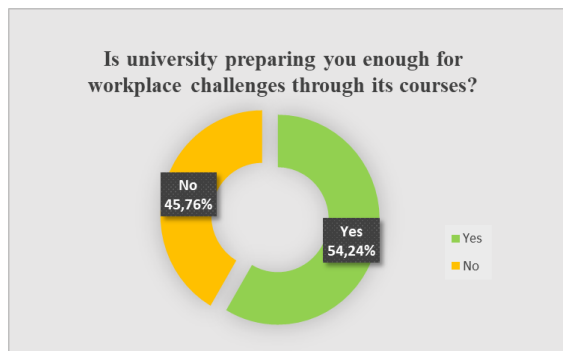


Figure 2: University Preparation for Workplace Challenges

Source: Own elaboration based on questionnaire responses

It is noteworthy that, despite a limited number of students actively working in this field, a substantial 49.15% of them have had exposure to accounting software, as can be observed from Figure 3, either through their workplace or as part of their curriculum within the university.

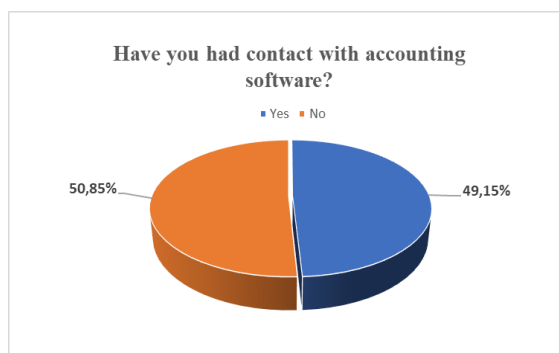


Figure 3: Usage of Accounting Software by Students
Source: Own elaboration based on questionnaire responses

The majority of respondents express concerns regarding the impact of digitalisation on the security and confidentiality of companies. Consequently, digitalisation is seen as advantageous for companies in terms of streamlining their operations, yet complete confidentiality of information cannot be entirely maintained, resulting in a relatively high level of transparency. We assume that those respondents who answered affirmatively (71.19%) to the question presented in the chart above (Fig. 4) believe that small and medium-sized enterprises can adapt to the digitalisation process as easily as larger corporations. On the other hand, those who responded negatively (28.81%) presumably attribute this to factors such as limitations in human, material, and financial resources.

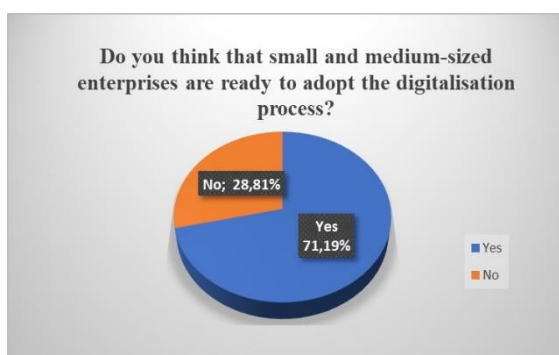


Figure 4: Digitalisation in small/medium-sized companies
Source: Own elaboration based on questionnaire responses

Within the surveyed student population, it is discerned (figure 5) that a majority, comprising 58.47%, regard digitalisation as a formidable challenge confronting contemporary and prospective accounting professionals, with the remaining 41.53% maintaining a contrasting perspective. It is hypothesized that this perceived challenge may be contingent upon the age and adaptive capabilities of the accounting practitioners.



Figure 5: Digitalisation challenges in accounting profession
Source: Own elaboration based on questionnaire responses

Furthermore, it is noteworthy that digitalisation is credited with a positive impact on the operational sphere of accounting professionals, as reported by 88.14% of the respondents, thereby contributing to the facilitation of their work processes (figure 6).

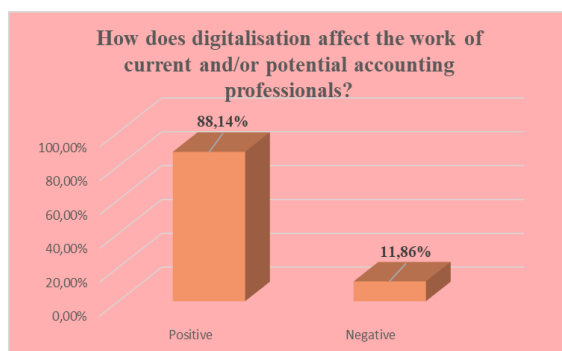


Figure 6: The impact of digitalisation
Source: Own elaboration based on questionnaire responses

In response to the query, "What is your opinion on digitalisation in accounting?" it emerges that a substantial proportion of the survey's participants articulate a multifaceted perspective, embracing both favorable and adverse facets of digitalisation within the realm of accounting. The affirmative stance underscores the benefits of reduced wait times, heightened operational efficiency, enhanced data accessibility, and a diminished reliance on paper-based records. Conversely, the negative stance spotlights concerns regarding potential data loss risks, stemming from either technical intricacies or vulnerabilities in security measures, as well as potential erosion of data confidentiality. Within this context, it becomes imperative for accounting professionals to not only possess a comprehensive grasp of accounting principles and standards but to also apply them judiciously, ensuring that their decisions remain consonant with these foundational precepts. In a broader sense, digitalisation should be envisaged not as a replacement for professional discernment but rather as an adjunct that synergistically reinforces and optimizes it.

Without exception, all survey participants concur on the necessity for supplementary specialization courses in the realm of digitalisation, alongside their scholastic or university-level education. The predominant viewpoint among the respondents favors a blended approach for the delivery of such courses, as can be observed in Figure 7.

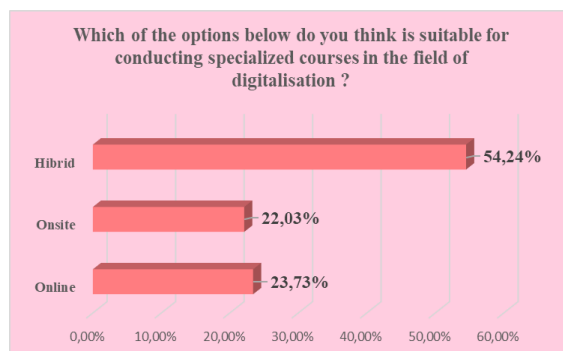


Figure 7: View-points regarding specialized courses regarding digitalisation
Source: Own elaboration based on questionnaire responses

5. Conclusion

Although one of the undergraduate study programs that accounting professionals should prioritize includes a curriculum closely aligned with the themes discussed in our research, our findings reveal that the overall academic focus on the latest information and communication technologies is somewhat limited. Nonetheless, we maintain our optimism that the necessity of embracing the technologies we have addressed will be swiftly recognized.

The rapidly advancing field of artificial intelligence significantly streamlines the work of accountants, entrusting them with the task of reviewing and interpreting generated operations and documents while ultimately applying professional judgment.

Our research has brought to light a multitude of opportunities in the field of accounting. These opportunities encompass automation, which effectively reduces the time and effort required for repetitive accounting tasks such as invoice recording and account reconciliation. Moreover, information systems excel in accuracy when compared to human data recording and value calculation. Accessibility is vastly improved, enabling financial documents and information to be stored and accessed with ease and efficiency, irrespective of geographical location. In addition, substantial cost reductions are realized, including decreased expenditures related to printing, transportation, document storage, and labor costs.

However, the digitalisation of accounting does present several challenges, such as the need for ongoing updates and training, reliance on technology, and the omnipresent risk of cyber threats. Cybersecurity vulnerabilities emerge, especially when data is stored in cloud-based or software solutions, demanding stringent security measures to shield information from cyber threats.

In alignment with the insights of Khanom (2020), our study's findings concur that digital technology exerts a substantial influence on the accounting profession,

demanding swift adaptation by accounting professionals to maintain their relevance within the industry.

Acknowledging the constraints of our research, which encompass a relatively limited sample size, a brief timeframe for responses, and a restricted number of survey questions, we aim to expand the scope of our inquiry. We intend to expand our research scope to encompass not only master's students at the University of Oradea but also students from other universities offering similar programs in the country. Furthermore, our aim is to extend the research to encompass practicing accounting professionals, with a specific focus on the challenges related to digitalisation and the incorporation of artificial intelligence in the field.

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**SECTION INTERNATIONAL BUSINESS, EUROPEAN
INTEGRATION, FOREIGN LANGUAGES AND BUSINESS
ENVIRONMENT**

CHRISTIAN AND MUSLIM ETHICS IN BUSINESS

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Abstract: *By tackling the theme of ethics in business, we underline that some essential principles should be considered in any business at any level. During the centuries, trades and businesses involved Christians and Muslims, reflecting cultural and religious elements. As nowadays economy becomes more and more of a war weapon, it should be noted that, at least for Christians and Muslims, some norms govern any trade or business. Religious traits cannot be eliminated from business as they are rooted in human character. Not only do the Bible and the Quran present such principles, but these religions' holy books emphasize their importance in everyday life. Man is accountable to God and responsible for his business, and any part of economic life should reflect spiritual values. The paper exemplifies that specific requirements should be applied in business. Both religions are promoted honesty, generosity, and equity. In Christianity and Islam, there is a particular emphasis on protecting the orphan, the widow, the poor, the sick, and the vulnerable. Any business should take this into account. The Bible and the Quran are the ultimate standard and ideals for individuals in association with other members of society. Even if we speak today of a secular society, human values must be reflected from small businesses to multinational corporations. Socio-moral and metaphysical norms and values mainly influence economic systems. Every economic system of the world is different from other economic systems prevailing due to its distinct features. Therefore, if the businesses conducted by Christians and Muslims follow ethical rules, they can contribute to a better global economy.*

Keywords: business, Christian ethics, Muslim ethics

JEL Classification: A13, B55, N30

1. Introduction

Ethics refers to a set of moral principles that control or influence a person's behavior. It is also defined as a system of moral principles that deals with what is good or bad as well as what constitutes one's moral duties and obligations. Starting from the meaning of the Greek word from which the English word "ethics" is derived, we discuss ethics or moral philosophy. We are referring to nothing less than the comprehensive scope of the moral sciences in all domains of human life. Therefore, in light of its etymology, the fundamental significance of ethics as a field of study in business and economics becomes quite clear. Ethics presents itself as a comprehensive academic discipline due to its diverse facets. Ethics has immense scope and complexity; it is significant because of its invaluable applications, particularly in business.

Ethics generally denotes the moral principles or standards of human conduct and a society's perception of what is good and evil. The moral principles of a society epitomize its shared values. It follows certain, but not all, core ethics that are shared by societies universally. Concerned with norms, these moral principles serve as a guide to human conduct. The ethical regulation of behavior is indispensable for the well-being of individuals and communities.

Hussain Mohi-ud-Din Qadri (2020: IX) states that issues and challenges have arisen due to changes in the means of production and trade, advances in information technology, the rise of globalization of consumer products, the advent of internet banking, and developments in the role and impact of financial institutions and multinational corporations. The current global business environment desperately needs to find ways to meet these challenges. Such an undertaking will require determining how to utilize ethics and choosing which set of ethics to use. In capitalist countries, business activities have not prioritized ethics for long. Secularist ideological orientation has pushed ethical values to a secondary place and detached economic activity from its domain. This has led to the emergence of many problems in the world. An unethical approach to business has always received criticism from scholars of various religions, philosophers, and business communities worldwide.

2. Overview of Religious Ethics

2.1. Overview of Christian Ethics

Christian ethics is primarily based on the principles that can be found in the Bible. Thus, it is regarded as an expression of the will of God lived in everyday life situations. The Christian is to imitate God in his perfection or holiness (Leviticus 11:45; Matthew 5:48) in his unchangeable character. Christian ethics are seen as absolute when discussing moral values that transcend time. For example, the Law of Moses is seen in its immediate and national character and its universal pattern that can be expressed in all cultures. Christianity sees revelation as general, memorable (in a specific context), in nature, and Scripture. General revelation is addressed to the entire humankind, and special revelation is addressed to the believers, but in both cases, the basis of human ethical responsibility is divine revelation.

Christian ethics is prescriptive and deontological because there is no moral law without a lawgiver (Geisler, 2010). The deontological aspect means that it is duty-centered, opposing the utilitarian perspective. To obey God, that is, to obey the teachings in the Bible is seen as a Christian duty that includes love for the created world. This means that it is paying attention to the results. Christians must anticipate the results and be aware of all possible consequences, avoiding evil.

The New Testament ethics is based on the believer being a disciple of Jesus Christ. According to Matthew chapters 5 to 7, the Gospel is written about how Christians should think and act. These teachings are not a continuation of the moral teachings in Judaism, as we can read in the Gospel. The first field of practicing moral values in Christianity was the church. The relationships between believers are regulated by the teachings of Jesus and are shown in the Book of Acts of the Apostles. The figure of Jesus Christ is central to the Christian faith and its moral teachings.

Augustine's *The City of God* gives a vivid picture of Christian ethics. There we can read about moral pillars such as love, kindness, faithful Justice, and patience, contrasting with what rules the earthly and decadent Rome: self-love and corruption, as Wogaman (2011:56), notices. Christian ethics is not a condemnation of other ethical systems but a way to integrate elements like faith, hope, and love into society. Alec Hill (2018:7) understands Christian ethics as being centered on God's character as it is revealed in the Bible. This makes Christian ethics different from other ethical perspectives, including egoism, utilitarianism, and deontological reasoning. Christian ethics does not see these as ultimate goals. Being a God-centered ethics, Christian ethics emphasizes a holy, just, and loving God. Holiness requires Christians to respect the principles of Scripture and act morally; a just God means an honest approach to all human fields of activity; a loving God means compassion and equity in the economic field.

2.2. Overview of Islamic Ethics

The Arabic term for ethics is *akhlaq*. Its singular form, *khulq*, is mentioned in *As-Shu'ara*: 137 and *al-Qalam*, 68:4. Another Arabic word is *adab* (manner) is closely related to *akhlaq*. Although some scholars think both terms have the same meaning, essential differences indicate application and source (Abdurezak, 2011). *Akhlaq* is a characteristic state of the soul that determines human actions based on moral philosophy; *adab* is the actual practice of moral philosophy.

Ethics are essential for developing beneficial Muslim conduct and character as commanded by Allah. As a fundamental requirement for beneficial living, ethics provide the means for deciding purposeful courses of action that otherwise would become random, arbitrary, and even aimless (Adibah, 2013).

Tariq Ramadan (Tariq Ramadan, 2017:151) emphasizes that in Islam, ethics is based on Muhammad's statement that one should act as if he sees Allah, who is invisible. In Islam, the ethical motivation is not social but spiritual, which means to serve Allah honestly. That is why there is a way – *shari'a* and a set of practices – *minhaj*, to attain the spiritual goal. Of course, in Islam, we can talk about a science regarding ethics, *'ilm al-akhlaq*, but one must consider the fact that the higher example of ethics in Islam is Muhammad himself. The rules in Islam are conceived so that one might change his behavior, making it more noble and virtuous. Every Muslim should get to the awareness of the good choice. Quran describes the

Muslim's life as a combination of faith and acts. The final aim should always be the good, serving humanity, and respecting the creation.

As a way of life, Islam encompasses a complete moral system that is an important aspect of its worldview. It stems from the belief in one God and considers humanity as a part of God's creation. The purpose of life is to worship God and live a life of harmony with the divine will, thus achieving peace in the world. The guiding principle for a Muslim's behavior comes from the Quran and is expressed in virtuous deeds. The guidelines of a Muslim include piety, humility, and a profound sense of accountability to God. The Muslim has to exercise control over passions and desires. Islam warns against vanity and excessive attachment to the pleasures of this world. It is required from every believer to practice charity, especially a man who achieved a critical amount of goods or money. In Islam, morality addresses every aspect of human life, from indoor practices to international relations. A Muslim must promote and contribute to the health of human society, thus being aware of the presence of God: speaking justly, showing moderation in the relationship with others, and in dealing with money or goods.

Islamic ethics are expressed in human character, in one's behavior derived from the Quran, which is also a complete code of living framed by ethical values. In Quran can be relevant terms for economic and business interaction, such as *maslahat* (public interest), *qist* (equity), *adl* (equilibrium and justice), and *haqq* (truth and right). Islamic ethics also emphasize the need to understand and develop virtue. Muslims also believe that science and technology must follow a process of evidence, justification, and truth. The several characteristics of Islamic ethics are exemplified in the message of the Quran as revealed to Prophet Muhammad and as inscribed in his *Sunnah* (Nanji, 1991). As a high moral principle and from Islam's ethical perspective, justice is defined as treating others fairly by providing them with what they rightfully deserve in the Islamic context and also by rightfully positioning things. Honesty is held in high regard. The Prophet even said to 'wait for the Day of Judgment when honesty is mislaid.' This indicates the woeful end of time and Judgment Day, when people will be condemned and punished for dishonest misconduct. Hence, in Islam, honest conduct is expected when dealing with other people and unites notions of candor and truthfulness in actions, relationships, and verbal exchanges. Thus, Islam compels truthfulness and forbids deceit. It is antithetical to Islamic ethics to mix truth with falsehood. An instance of this is telling the partial truth when witnessing a crime committed by someone related to you. Allah forbids concealing truth when you know it, for example, lying to a family member who committed theft to prevent the pursuit of justice. Allah reprimands Muslims to follow his instructions via Quran to prohibit lying.

Ethics comprise the most crucial prerequisite elements for building humankind's character and, as mentioned in al-Quran: worshiping God, performing what is good, and avoiding bad actions. Islamic ethics are the most beneficial guidance for use in advancing life and avoiding wrongdoing. Moreover, they motivate humankind to advance the importance of Islamic ethics in global development. With all the excitement of modern progress, we should not neglect the critical role of ethics in establishing harmony, prosperity, and peace. As the religion of mercy, Islam should be the central reference and guideline in drafting a global code of ethics in accordance with Islam's characteristics that bring a complete multidimensional perspective and way of life. In addition, Islam's ethical value judgments transcend

worldly gains and relativist interpretations. You are invited to use figures and tables in your paper wherever they will help to illustrate your text. The proceedings are delivered to conference participants in electronic format, supporting color figures; however, the book version is printed in black and white. Therefore, you are advised to refrain from using colors to deliver critical information in your figures.

3. Business Ethics

3.1. Business Ethics in Christianity

Christianity follows the model of Jesus Christ, who humbled himself, identifying with the marginalized people, those who had no political power, and those who were socially disadvantaged. He was born in a land part of colonial power and lived in a simple family. His life was dedicated to the poor and hopeless. He was constantly against those who obtained gains by exploiting the helpless people (Luke 26:46-47) or ignored the critical situation of the poor (Luke 6:24-25; 16:25). According to The Gospel of Matthew 25:34-36, Jesus identifies himself with the hungry, the thirsty, the foreigner, the sick.

Following the example of Jesus, the Christian church has the mandate of taking care of the poor and disadvantaged people as the moral core of its practice. Seeking social justice and civic equity, the church is fulfilling its mission. The first Christian communities shared the goods and the possessions, each community member being seen as a part of the Body of Christ (Acts 2:44-45; 4:32-37). The Church Father promoted the idea and the practice of compassion. Basil the Great protested against the inequity between the rich and the poor, stating that anyone who exploits the poor for profit should be condemned. Chrysostom condemned those who were getting rich by illicit means, oppressing the poor. For him, the rich man who did not share his goods with the poor is an evildoer.

Following this pattern, the Christian culture deals with the evil economic and business way promoted in society; Basil the Great considers that business that leads to the lack of goods for the people should be stopped. That is why he promoted the just redistribution of goods. In today's society, the church pleads for fair incomes for all employees, sustaining fiscal policies that lead to equity. The church leaders often pleaded for just laws that could be applied in society. The church voice is heard against paid slavery (Pentru vița lumii, către un etos social al bisericii ortodoxe, 2020:67).

Bible teaching sustains work fair paid (Timothy 5:13), that is, a decent salary and opportunities for rest. Investors should pay attention to all regions of the world and give everybody a chance to have a job, so each region should be economically developed. The church condemns irrational waste of money, those initiatives that do more harm than good. Christian teaching condemns the focus only on profit as well as corruption. One aspect that is the church's attention is the avoidance of huge debts. A credit-centered capitalist society is creating modern slaves. Such creditors are condemned in Christian teaching (Jacob 2:6).

Pope Francis addressed economic and business issues in two of his writings: *Evangelii Gaudium*, *2013) and *Laudato si* (2015). In *Evangelii gaudium* (<https://www.magisteriu.ro/evangelii-gaudium-2013/>), Pope Francis pleads for a missionary church even in economic and business contexts. It has to take the

initiative, abandon the passive role, or concentrate on internal aspects. The church should say no to an economy of exclusion, no to the idolatry of money, no to the money that governs and not serves, no to inequity that generates violence, and no to selfish apathy. Pope Francis promotes a vision that includes the poor fairly in society, protects the vulnerable, and creates the common good and social peace. *Laudato si* (<https://www.magisteriu.ro/laudato-si-2015/>) is a theological reflection underlining that the world is the house of all humanity. This means in Christian terms that no one should be excluded and no one should be privileged; because all have equal dignity as the creation of God.

From the protestant perspective, one must consider Max Weber's thesis about the protestant work ethos: hard work, temperance, efficiency, and long-term investment. This perspective is based on the biblical idea (especially in Old Testament writings) that personal abilities and hard work are blessings from God, not seen just in religious terms but also in social terms. That is why taking care of the poor and protecting the vulnerable ones is a duty, privileges being followed by duty. This is expressed in practical terms such as the right to rest (Exodus 23:10-12), and erasing the debts every seventh year (Deuteronomy 15:1-3; Leviticus 25:8-631). Applying these social laws avoided the unlimited concentration of wealth in the hands of several persons.

Not opposed, but complementary, one can find in the writings of the New Testament how the negative consequences can be avoided in the business field, that is, developing generosity and care for the vulnerable and poor (Luke 16:19-31; Matthew 25:36-43). Christian teaching promotes a non-discriminatory attitude in business, and all the institutions involved should facilitate the entrepreneur to contribute to the market for the common good (Ingeborg G. Gabriel, 2022, p.99).

3.2. *Business Ethics in Islam*

Islamic business finance is based on ethical solid regulations, as Islamic literature suggests, such as the Quran and the Traditions of the Prophet of Islam. The faithful must do right, intending to merit the pleasure of Allah. To achieve this objective, Islam offers elements of theoretical and practical ethics. For the purpose of gaining awareness of the former, the Quran and Prophetic Traditions contain sufficient material.

Hussain Mohi-ud-Din Qadri (2020:6) points out the fact that purity of intention is one of the cornerstones, fundamental supports, and most essential integrals of religion. The very act of earning one's goods is an act of service to the Divine when the intention is wholesome. When one performs a lawful act, Allah accepts it on condition that it is carried out for His sake. In the light of the Quran, evil deeds cannot change into good ones under any circumstance – no matter how good the intention or how worthy the aim. The Holy Book of Islam describes the trade journeys of the Arabs in various seasons as a Divine grace towards them. The social and economic prosperity of the people of Mecca depended on their trading caravans. Their two annual trade caravans, one to Yemen in the winter and the other to Syria in the summer, have been described.

First and foremost, Islamic directives are meant to deliver people from the penalty and attain the good pleasure of Allah in the Afterlife. Yet, the Divine commandments, when practiced, benefit the practitioners in material terms too.

Gratitude (shukr) is a feeling of being thankful to those who do us a favor to us. From the Islamic perspective, none deserves our gratitude more than Allah, from whom we received our existence and what we possess. Humans have every reason to be grateful to Allah for His loving care, mercy, and favors. One of the essential teachings of the Muslim religion is that expressing thanks to Allah the Exalted is the key to attracting abundance, happiness, prosperity, and inner peace. A thankful appreciation for our tangible and intangible gifts helps us focus our mind on Allah Most High, a thought we fail to care about on account of preoccupations with the materialistic world and its attractions. If wealth is earned with a purity of intention and employed for good purposes, then work rises to an act of worship in the sight of Allah. Rules pertaining to acquiring wealth in the Muslim religion demonstrate its importance. Material goods are vital for fulfilling one's responsibilities, supporting dependents, and reducing societal destitution. The Muslim religion urges us to work to earn and regards work as significant, a sacred struggle for justice and an act of worship.

A critical element in Islamic business ethics is moderation. The solution to economic ills is economizing, not rushing into competition for more and more wealth. Therefore, the key to economic prosperity is living within one's means.

In Islam, it is said that there are 20 ways of making a livelihood: 19 of them are inclusively for traders, and just one way is open to industrialists. That is why most rules in Muslim ethics refer to trade. Business and trade among Muslims are not new things. If highlighted the trading history of Islam, its history starts in the early scene where the man, two sons of Adam, Habil, and Qabil namely has dealt with the field of entrepreneurship. Entrepreneurs need to follow some rules and business ethics outlined in Islam, not to fraud, abuse, and so on, which eventually led to the collapse of the Islamic economy and threatened the well-being of society. Thus, the intention is the basis of an act because it sets a target or goal in heart infusion. The implementation chosen by Allah usually accompanies good faith. Then, the practice of usury is forbidden in Islam because it causes oppression and inequality in society and the national economy. This will cause the rich to get richer and the poor to be poorer. Both sides, traders, and consumers, should take their roles to ensure that the business is carried on last well and that there is no fraud. The Quran repeatedly reminds traders to be honest and strictly prohibits fraud and corruption in business. Ethical traders must perform al-Adl or Justice. This means that traders must be temperate in all things without the benefit side, equal treatment or fair to all customers, considering fair and unbiased and giving the right to the right. In other words, justice means putting things in the right place. A trader or entrepreneur cannot cheat, betray customers, sell prices too high, and delay supplier payments. Traders must trust in every transaction made. Therefore, all actions and decisions made in a business based on the nature of trust are necessary to ensure that the business is fair to everyone, whether a buyer or seller, to get the right. Fraud and oppression will be avoided if all parties are trustworthy.

3.3. Common ground in Christian and Islamic Business Ethics

Rafik Issa Beekun (Beekun, 2014:2-8) states that certain factors like legal interpretation, personal value and personality, family influence, peer influence, situational factors, and life experience can influence ethical behavior in Islam. Islamic

ethical values are not a substitute for universal values and virtues but rather build on these by stressing compassion, tolerance, leniency, benevolence, and hospitality. The same is true for Christianity. However, Christianity focuses on universal principles: honesty in the business setting, treating people right in business, fairness in business practices, and donating to worthy causes, as Bluefield University states (<https://www.bluefield.edu/blog/importance-christian-ethics-business/>).

The edifice of the whole of life in Islam and Christianity rests on absolute ethical values. These values are laid down and emphasized in the Quran and the Bible. Many of the ethical values laid down in Islam are not unique to Islamic society. The same is true for Christianity. They have been universally observed but constrained by temporal and spatial limitations to achieve the interest of some particular person, society, class, or territory. Islamic and Christian ethical values represent universal ethical values. These values are not amenable to restriction to a particular society or region.

Among the set of values, the Quran and the Bible emphasize are the concepts of justice and benevolence. The concept of justice occupies a central place in the economic system of Islam and Christianity. This value is prescribed in legal, social, moral, and economic dealings. It is to be practiced with individuals, orphans, wives, tribes, communities, nations, and even peaceful enemies. It applies to speaking, giving witness, writing an agreement, arbitrating between parties, dealing with other people, judging in court, and making business transactions. The concept of justice in an economic context encompasses fairness, equity, balance and equilibrium, symmetry, and impartiality. Both religions promote generosity, honesty, and accountability to God. In both religions, the principles stem from a Holy Book (Bible and Quran).

4. Conclusion

As we have seen, there are many similarities in approaching business as a Christian and as a Muslim. Some common points link the two ethical systems regarding the economic domain. Both emphasize human accountability to God, as man is seen as a part of God's creation. They understand and teach the link between the material and the spiritual world. Thus, man should be honest, generous, act lawful, moderate, and promote equity. The precepts of Christian and Islamic economics have the ability to guide modern society toward a better future.

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THE IMPLICATION OF THE RUSSIAN INVASION OF UKRAINE ON THE EUROPEAN ENERGY SUPPLY

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Abstract: *The invasion of Russia into Ukraine is primarily a humanitarian concern, compounded by the energy crisis that has far-reaching implications for the European Union and other global regions. This paper reviews the implication of the Russian invasion of Ukraine on European energy security to provide an overview of the European energy dependency on Russian and how the sanctions levied by the EU affected the energy supply. Also, it offers some insights into alternative energy sources' role in providing more sustainable and autonomous energy sources.*

Keywords: Energy security; Russia-Ukraine war; Sustainable energy; EU's energy policy; European economies

JEL classification: F52; Q01; E31; Q43.

1. Introduction

In February 2022, Russia invaded and occupied parts of Ukraine. This event caused a decrease in the amount of gas that Russia exported to European Union countries. For many years, EU nations relied heavily on Russian gas supplies; however, this conflict made them question their energy security and political relationships with Russia as a partner nation. As a top natural gas supplier to EU countries for an extended period, this conflict raised concerns about energy supply security and political dependability as partners with Russia. (Mbah and Wasum, 2022).

In response to Ukraine's invasion, The European Union (EU), among other countries, has imposed harsh sanctions on Russia. Financial transactions are restricted, assets of Russia's main banks and chosen persons are frozen, exports of high-tech equipment to Russia are prohibited, and the country's skies and waterways are closed (Funakoshi et al., 2022).

EU countries have detailed intentions to reduce their energy dependence on Russia more quickly than previously thought (European Commission, 2022a). Countries began limiting Russia's fossil fuel exports in addition to targeting financial markets and service industries. Furthermore, foreign oil corporations such as Equinor, Exxon Mobil, and Shell are limiting their operations in Russia (Funakoshi et al., 2022). Almost a thousand multinational corporations stopped operating in Russia. Costing Russia 40% of its GDP, effectively undoing almost three decades of foreign investment (Sonnenfeld et al., 2022).

The continuing rise of energy prices is a significant concern for businesses amidst the energy supply disruption caused by Russia. The European Union continues to depend significantly on Russia's energy supply, specifically in gas and oil, constituting 25% and 40% of Europe's energy supply (European Commission, 2022). The diminished availability of these resources has already led to fuel rationing and escalated costs, thereby potentially affecting heavily dependent enterprises.

Therefore, Europe has been actively seeking ways to reduce its reliance on Russian-produced oil by diversifying energy sources like wind or solar power while investing more in other avenues, such as the Southern Gas Corridor that can transport fuel from Central Asia directly into mainland Europe via pipeline systems (Halser and Paraschiv, 2022).

2. European energy dependency on Russia

The gas consumption of the 27 member states of the European Union in the year 2021 amounted to 412 billion cubic meters. Gas is primarily utilized for the purposes of power generation, household heating, and industrial processes. Gas is utilized for heating purposes in more than 30% of households across the European Union. (Eurostat, 2023a)

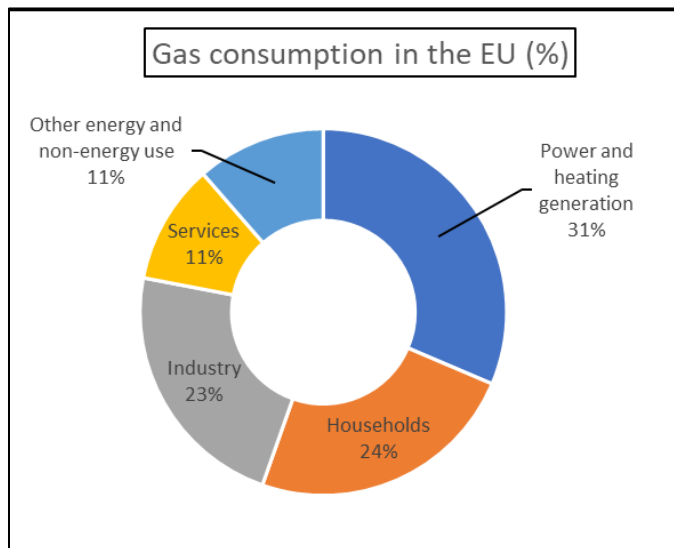


Figure 1. Gas consumption utilization in the EU, 2021

Source: From [Eurostat \(2023a\)](#)

The data in Figure 2 below indicates that Russia held the highest proportion of petroleum oil supply in the initial quarter of 2022, accounting for 26.0% of the total share. The invasion of Ukraine by Russia resulted in notable alterations in the distribution of primary partners due to a number of sanctions that had a direct or indirect impact on the trade of energy commodities. In the fourth quarter of 2022, Russia's proportion decreased by 16.0 percentage points in comparison to the first quarter of 2022, amounting to 9.9%.

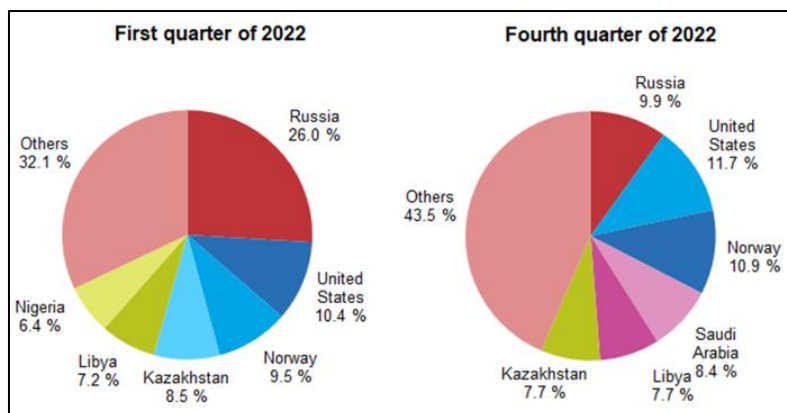


Figure 2. Extra-EU imports of petroleum oil by country, 2022

Source: From [Eurostat database \(Comext\)](#) and [Eurostat estimates](#)

The supply of natural gas from Russia progressively reduced after Russia invaded Ukraine and in light of sanctions implemented by the European Union. With a share of 31.3% in the first quarter of 2022, Russia was also the top natural gas supplier to the EU, followed by Norway (25.8%) and the US (16.1%) (see Figure 3). Russia's participation decreased by 15.5 percentage points compared to the first quarter of 2022 and was 15.8% in the fourth quarter. The shares of Qatar, Algeria, and the United Kingdom all climbed within the same time frame.

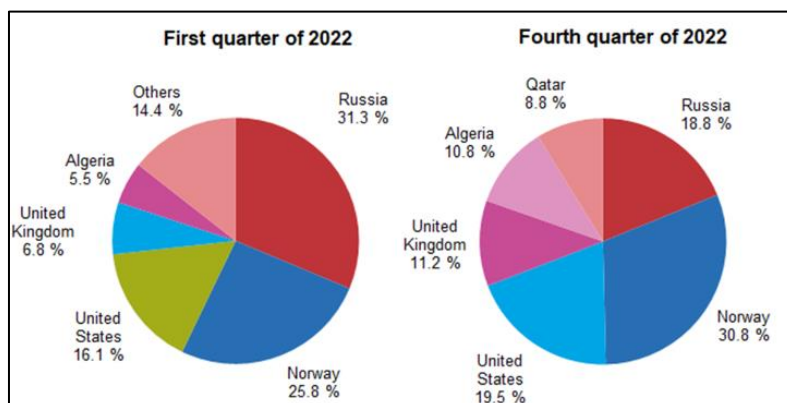


Figure 3. Extra-EU imports of natural gas by country, 2022

Source: From [Eurostat database \(Comext\)](#) and [Eurostat estimates](#)

24.4% of the energy used by the EU is imported from Russia. The proportion of each fuel in the energy mix and the reliance on fuel imports from a particular source determine how dependent a nation is on that nation for its energy needs. Although the critical sources of the EU's energy imports have varied in recent years, Russia has continued to serve as the EU's top supplier of all significant primary energy commodities, including natural gas, crude oil, and hard coal.

Energy dependency on Russia varies greatly depending on the nation due to its diverse energy mix and reliance on imports. Lithuania (96.1%) had the highest percentage of its EU energy demands met by imports from Russia in 2020, followed by Slovakia (57.3%) and Hungary (54.2%). Cyprus (1.7%) has the lowest dependence rate, followed by Ireland (3.2%) and Luxembourg (4.3%).

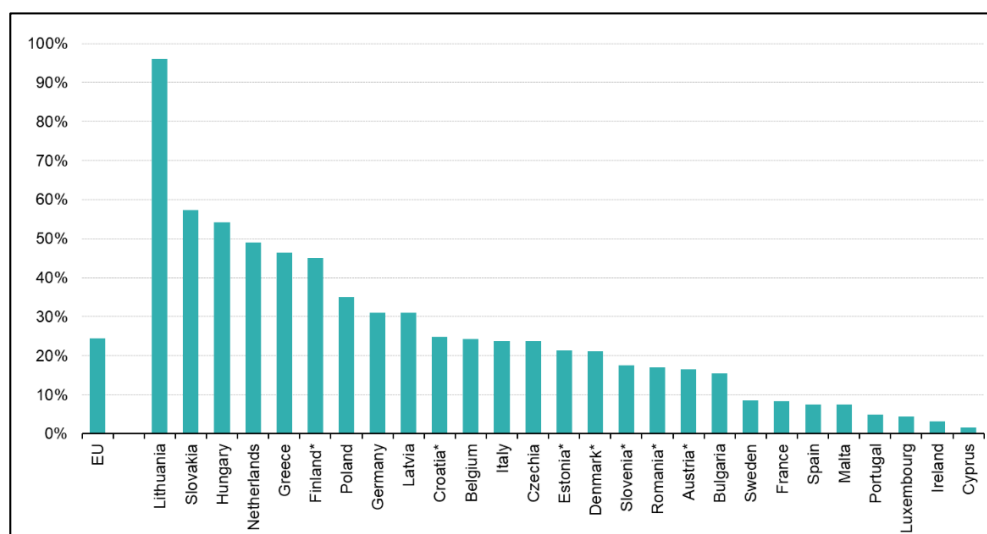


Figure 4. Imports from Russia in gross available energy, EU, 2020

Source: [Eurostat database](#), including estimates for non-reported data

According to the Eurostat (Crude oil imports and prices: changes in 2022, News Article). Between Q4 2021 and January 2022, the quantity of imports originating from Russia fluctuated between 39,657 thousand barrels and 49,698 thousand barrels, representing a proportion of 24% to 31% of the aggregate imports.

The incursion of Russia into Ukraine in February of 2022 had a notable effect on the importation of crude oil into the European Union. In the period spanning from February to April, we witnessed a volatile state of affairs in the domain of total imports, with figures of 33% and 30% pertaining to the same.

Between May and September of 2022, there was a notable reduction in the proportion of imports originating from Russia, which declined to 12% of the total imports and maintained a relatively stable trend after that.

The Council adopted the sixth package of EU sanctions against Russia in June, including a ban on importing Russian seaborne crude oil effective from December 2022. Commencing in September, imports gradually declined, ultimately resulting in a representation of 4% of the aggregate imports.

This decline was compensated by the increase in imports from other countries. Largely the United States and other sources like Libya and Kazakhstan.

3. Macroeconomic indicators

3.1. Energy prices

Crude oil prices are determined by two factors, namely, the spot market and the crude oil variety. Prior to the onset of Russian aggression towards Ukraine, crude oil prices remained relatively stable at approximately 80 US dollars per barrel, exhibiting minimal variation across different crude oil types (less than 4 US dollars per barrel).

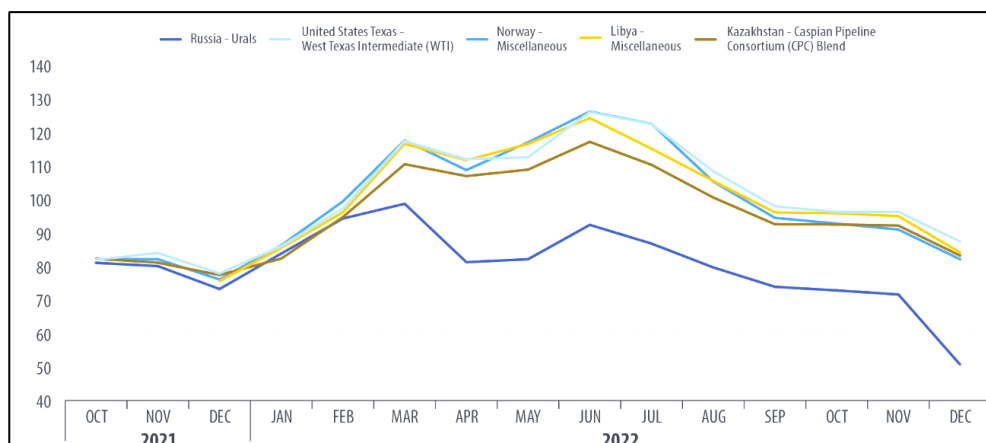


Figure 4. Price development of the 5 most important crude oils imported into EU, Average price – USD per barrel.

Source: [Eurostat database](#)

The market experienced high volatility due to the unstable geopolitical situation, resulting in a significant increase in crude oil prices from February 2022.

During March 2022, the price of Russian crude oil (Urals) was comparatively lower than other prevalent oil types, exhibiting a discount of around 16 US dollars per barrel in contrast to the mean price of the remaining four oil types. During the subsequent months, Urals crude oil from Russia was traded at a significantly reduced rate of approximately 30 US dollars per barrel.

Concurrently, the prices of alternative oil varieties began to exhibit more significant fluctuations.

During June and July 2022, the market showed lower stability, as evidenced by the price discrepancies among the four most prevalent oil types, ranging from 9 to 12 US dollars per barrel. These figures represent a three to four-fold increase compared to pre-war levels.

Towards the end of the year, a sense of stability was observed, as there was a decline in imports from Russia, a reduction in crude oil prices, and a decrease in price volatility. The European Union's primary crude oil providers comprised the United States, Norway, and Kazakhstan. This indicates that the EU successfully adjusted to the evolving oil market terrain and effectively eliminated its reliance on Russian oil.

3.2. Inflation and interest rates

According to the Deloitte European Chief Financial Officers study, many industries are impacted by this disruption of the supply chain. These industries countered that by diversifying their supply and localizing their supply sources. Strategic responses by manufacturers to supply chain disruptions have centered on increasing inventory levels. (Deloitte, 2022).

The increase in commodity prices fueled inflation; as of 2022, the European Union's average annual inflation rate almost reached 7%, coupled with reduced industries and enterprises capacity due to fuel costs increase. Figure 5 shows the spike in inflation, especially post-invasion.

Other factors hurting company performance include increasing interest rates due to skyrocketing inflation, which limits firms' ability to borrow money and reduce their investment activities. Rising energy costs also harm the trust of consumers and businesses.

Business confidence barely got back to normal as it recovered from the Covid-19 pandemic, just to significantly decline in 2021 due to the energy disruption caused by the war (Deloitte, 2022).

Overall, the energy price shock's potential to significantly disrupt spending and investment further amplifies its effects and limits growth prospects in the EU, with economic growth projected to be just 1.5% in 2023 due to high uncertainty caused by geopolitical risk and a decline in business confidence (European Commission Economic Forecast, 2022).

Moreover, the continuous increase in inflation negatively impacts the daily lives of people. Especially low-income households where energy and food make a significant portion of their consumption (Charalampakis et al., 2022).

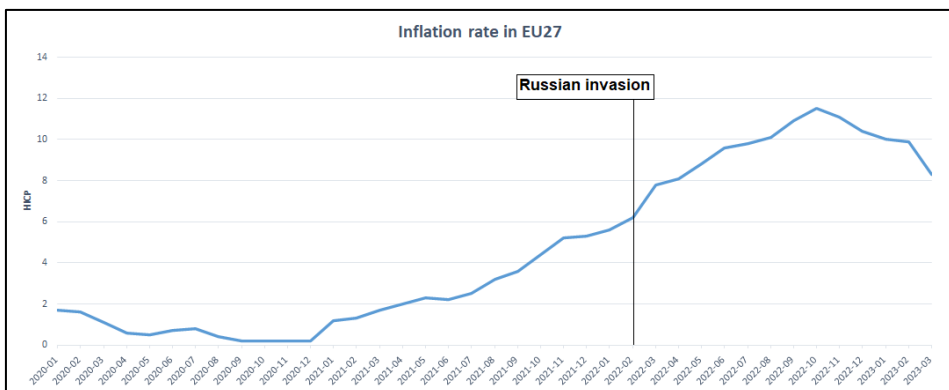


Figure 5. Price development of the 5 most important crude oils imported into EU, Average price – USD per barrel.

Source: [Eurostat database](#)

4. Alternative Energy Sources

On 18th of May 2022, The European Commission presented in Brussels the REPowerEU Plan, "A plan to rapidly reduce dependence on Russian energy sources and fast forward the green transition" As a response to the global energy market disruption caused by the Russian invasion of Ukraine in an effort to end Europe's dependency on Russian fossil fuels, which are exploited as economic and political weapons and cost taxpayers about billions of euros per year, and addressing the climate catastrophe is urgent (European Commission, 2022b).

The current responses reinforce the concept of a closely intertwined relationship between energy security, climate, and other factors in Europe. The REPowerEU strategy is centered on three pillars, two focused on sustainable energy: the acceleration of clean energy and energy savings. Regarding the pillar of accelerating clean energy transitions, the European Union has projected that renewable energy sources will supplant 20 billion cubic metres of gas imports by the conclusion of 2022.

As alluded to earlier, prior to the Russian invasion, the majority of gas imports to the EU came from Russia. Post-invasion and in light of the sanction on the Russian imports to the EU, wind, and solar played an important role in generating electricity to replace the deficit in gas. For the first time, in the EU, wind and solar energy sources generated more than gas. Figure 6 shows the share of electricity generation (%)

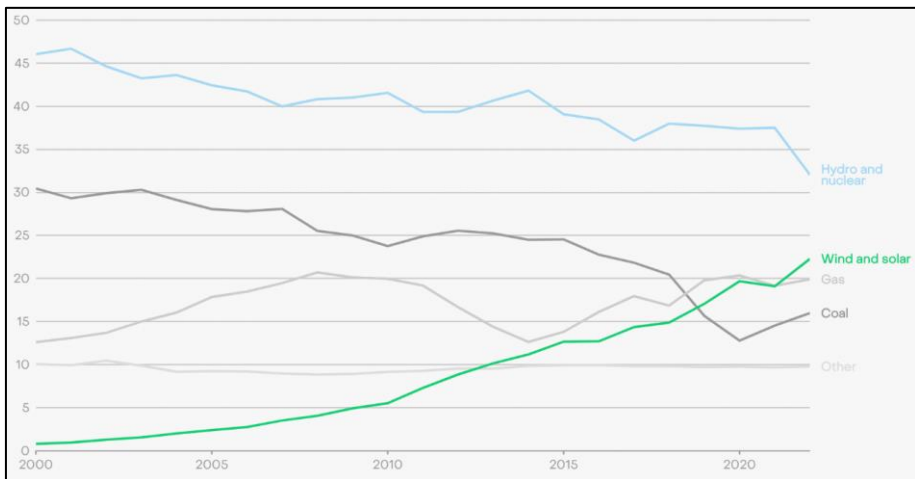


Figure 6. Share of electricity generation by the source of energy (%).

Source: [Ember Electricity Data Explorer](#).

The European Commission has implemented several measures to achieve its objective. These include increasing the 2030 renewables target to 45% from 40%, committing to a doubling of solar energy capacity by 2025, introducing a Commission Recommendation to address the issue of slow and complicated permitting for major renewable projects, and proposing an amendment to the Renewable Energy Directive to acknowledge renewable energy as a paramount public interest. In connection with this, it is worth noting that an extra EUR 29 billion will be allocated towards electricity projects of common interest, which include cross-border interconnected grid infrastructure. This investment aims to address the challenge of balancing increasingly variable grids (European Commission, 2022b). Several nations have recently declared significant modifications to their energy policies. For instance, Germany has pledged to achieve complete reliance on renewable electricity by 2035. Additionally, Denmark, the Netherlands, the United Kingdom, France, and Germany have disclosed plans to expedite the implementation of renewable energy projects (Rokkle N, 2022 & De Pous, 2022). Furthermore, Norway and Italy have unveiled new wind farm initiatives. Norway's proposed strategy to augment the number of wind turbines from the present two to 1500, with a capacity of 30 gigawatts, by 2040, indicates a shift in its renewable energy policy trajectory (Rokkle, 2022).

The successful implementation of these renewable policies implies a significant expansion in Europe's utilization of solar, onshore, and offshore wind energy. The observed phenomenon pertains to a conspicuous hastening of prevailing patterns in sustainable energy (IRENA, 2022).

5. Conclusions and comments

In a nutshell, the invasion of Russia into Ukraine is primarily a humanitarian concern, compounded by the energy crisis that has far-reaching implications for the European Union and other global regions.

One plausible strategy for the European Union to address its dependency is prioritizing renewable energy sources and sustainability in energy policy. Expressing the pressing need to swiftly decrease reliance on Russian energy sources and accelerate the shift towards sustainable energy sources in REPowerEU Plan.

The current crisis has shifted political focus towards geopolitical supply security, but a greater emphasis on these other factors could help counter the EU's dependency. In light of this reorientation, implementing clean energy sources has surfaced as the most optimal resolution for ensuring long-term energy security in Europe, as demonstrated by the magnitude of recent pledges.

This mentioned shift in focus has shaped European policy decisions that have further compounded challenges related to energy affordability and accessibility. The current economic viability of renewable electricity has improved significantly due to a substantial price reduction. Finally, concerns regarding the security of short-term energy supply may prolong the utilization of coal and gas, and exacerbate the escalating global tensions concerning sustainable transitions, precisely when heightened international collaboration is imperative for achieving sustainable objectives.

This study has its limitation; from a methodology point of view, no analysis is made on the mentioned variable, which is something to be considered for future papers to view in detail the effect of the Russian invasion.

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ASSESSING THE ECONOMIC IMPACT OF INTEGRATING INTERNATIONAL PROTECTION BENEFICIARIES IN ROMANIA

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Abstract: *The integration of beneficiaries of international protection is both a social and economic challenge for Romania. On the one hand, they can contribute to the budget and stimulate the economy through work and consumption, but on the other hand they require initial investment for integration. Studies show that effective integration can generate long-term economic benefits for host countries, but also that barriers such as access to the labour market, education or housing exist. Sound statistical data and relevant indicators are essential to inform policies. Integration is also a European priority, with the EU supporting inclusion through access to essential services. The costs of integration in Romania are estimated at 8000 euro/person annually and include accommodation, education, health. The materialized benefits indicate a contribution of over 4000 euros / year from a employed refugee. Financing in Romania comes mainly from EU funds such as AMIF or ERDF, non-reimbursable. National policy provides for measures such as training, reskilling and collaboration with Employment Agencies for Integration into the labour market. Global estimates indicate tax benefits of more than €110 million for 20 years after the integration of 100,000 refugees. Research shows mixed views on the economic impact, but also real difficulties in integrating into the labour market due to recognition of qualifications. Active policies and public-private partnerships are needed to increase employability and unlock the long-term potential of refugees.*

Keywords: *international protection, economic integration, immigration, benefits and costs, globalization.*

JEL Classification: F53; F60

1. Introduction

Immigration is a complex phenomenon with multiple social, cultural and economic implications. In the context of globalization and recent international crises, the number of immigrants seeking protection in Romania has increased significantly in recent years. This development presents the authorities with the challenge of developing effective public policies for the integration of newcomers.

The integration of beneficiaries of international protection into Romanian society is a complex challenge, involving not only social and humanitarian aspects, but also economic aspects. On the one hand, these beneficiaries can bring economic benefits through their contribution to the state budget, by paying taxes and duties, and by diversifying the labour market and available skills. They can become contributors to the economy through employment and consumption, while stimulating domestic demand.

In terms of integration, data highlight difficulties such as reduced access to the labour market, with an unemployment rate of over 60% among working-age adults among beneficiaries of protection (UNHCR, 2021). Access to Romanian services and language courses remains limited. Thus, knowledge of Romanian remains an ideal difficult to achieve for many beneficiaries of international protection.

Studies show that effective socio-economic integration of refugees not only helps reduce poverty and increase social cohesion, but can also bring long-term economic benefits for host countries (Buber-Enns et al., 2016; Martín et al., 2016). However, refugee integration faces many barriers, such as limited access to the labour market, education, housing or health services (Phillimore, 2011; UNHCR, 2013).

Recent studies highlight the importance of using solid and comprehensive statistical indicators in analysing the integration of migrants and refugees, data being essential for substantiating public policies in the field (Connor, 2010; Hainmueller et al., 2016). Therefore, the present analysis aimed to cover several variables relevant in economics, using validated statistical sources.

Beyond academic literature, refugee integration is also high on the agenda of the European institutions. For example, the EU Action Plan on Integration and Inclusion for 2021-2027 sets as a strategic objective to support the socio-economic inclusion of refugees and asylum seekers through concrete measures to facilitate access to the labour market, education, housing, healthcare and other essential services (Europeană, 2020).

However, their integration can also have financial costs for the state and society, requiring investment in social and professional integration programmes, such as language courses, retraining and job support. Also, in order to reap the potential economic benefits, the authorities need to be actively involved in creating an appropriate framework to support integration.

Therefore, assessing the economic impact of integration becomes crucial to identify opportunities and associated challenges. This study aims to analyse both the benefits and financial costs associated with the refugee integration process in Romania.

Several relevant data sources and information were analysed to conduct this study. Thus, the reports and studies of the International Organization for Migration, the European Commission, as well as the Council of Europe and the EU Agency for Fundamental Rights assessing the economic impact of the integration of refugees in EU Member States were studied.

Official documents of the Romanian authorities, including national reports on the integration strategy of beneficiaries of international protection, were also examined.

Important statistical data were collected from the Eurostat database and from the national statistical sources of the National Institute of Statistics.

In order to quantify more accurately the financial costs and benefits, data on budget expenditures allocated to integration, collected from competent government institutions, were also analysed.

All data were processed and integrated according to a standardized analysis methodology, the results being presented based on relevant economic and financial indicators.

Also, quantitative research was carried out at the level of the society from Romania, at the level of beneficiaries of protection and at the level of integration specialists. In this article were presented and analysed some items that are related to the economic factor of integration.

2. The economic impact of the integration of beneficiaries of international protection into Romanian society

Studies and reports analysed show that the economic integration of beneficiaries of international protection in Romania can generate both benefits and costs for the economy.

Therefore, a careful analysis of this cost-benefit ratio is important to better understand the net impact of refugee integration on the Romanian economy.

Benefits

The contribution to the state budget represents one of the most direct benefits brought by the successful integration of beneficiaries of international protection into the Romanian labor market. As they find jobs and start doing paid work, they become taxpayers who pay taxes to the state. Data shows that currently only a share, below 50%, of refugees present in Romania are employed. The more of them will find employment in legal activities and enter the taxation system, the more revenues collected to the budget will increase (Eurostat, 2015-2022).

According to estimates, on average a refugee can bring an annual net budget benefit of over 4,000 euros, due to taxes paid. The contributions made by their integration will also continue to increase as more people access stable jobs and pay social contributions and income taxes. A study by the Canadian Refugee Council estimated that integrating 100,000 refugees into Canada would generate net tax revenues of more than \$652 million over 20 years (Kaida et al., 2020).

At the same time, the integration of beneficiaries of international protection can have a positive impact on the economy also through consumption. A significant part of refugees' income from paid activities is spent on the local market, stimulating domestic demand and supporting the activity of several economic sectors. Also, the diversification of the labour market through the skills and qualifications brought by some displaced persons is likely to increase the share of high value-added activities in certain sectors of the Romanian economy.

In addition to primary contributions generated directly to the budget and induced indirectly through consumption, the integration of beneficiaries of international protection can have other benefits in the medium and long term. For example, local

communities could benefit in the future from a culturally diverse workforce with complementary skills to other residents, which could reduce recruitment costs and help alleviate structural labour shortages in certain regions and sectors. Over time, the labour market can thus gain dynamism and companies can diversify their human resources, increasing their capacity to cope with changes in the economic and social environment.

Costs

In addition to the economic benefits brought, the integration of beneficiaries of international protection also involves financial costs for the Romanian state. According to the cited report of the European Agency for Fundamental Rights, on average the integrated costs of a beneficiary of international protection amount to approximately EUR 8,000 per year in Romania. It is important to note, however, that this estimate represents an average value, costs can vary significantly depending on the specifics of each person's skills, medical and social needs, as well as the length of stay in the country.

The main categories of costs included are those related to initial reception (accommodation, food, initial healthcare), early years social assistance (language courses, active employment measures, education and training systems) and long-term integration (access to housing, labour market, education, healthcare). Applying legislation and administrative procedures is also costly from a budgetary point of view (României, 2020).

Initial investment in social and professional integration is a prerequisite for beneficiaries of protection to start contributing to the budget through work and consumption. However, the sums involved can put pressure on public finances, especially in the case of large flows of asylum applications. Therefore, it is necessary to plan well and correlate the allocated resources with the real integration needs of beneficiaries, so that public funds are used as efficiently as possible.

3. Financing the Integration Programme for Beneficiaries of International Protection in Romania

The system of protection and integration of applicants and beneficiaries of international protection in Romania benefits to the greatest extent from financing through non-reimbursable European funds. The main budgetary sources for the implementation of public policies and programmes for immigrants are represented by the European Asylum, Migration and Integration Fund (AMIF), as well as the European Regional Development Fund (ERDF). In 2014-2020, Romania allocated over €27 million for activities in the field of asylum, migration and integration through AMIF (DFEN and OFUE, 2023).

Vocational training and reskilling programmes are one of the main lines of funding carried out with AMIF support. According to the 2014 regulation on the Fund, the Romanian State has the obligation to provide Romanian language courses and socio-cultural orientation to all beneficiaries of international protection. At the same time, professional courses are offered to improve immigrants' chances of employment on the Romanian labour market in areas subject to labour shortages.

The financing of these training / professional requalification programs is made entirely from the budget allocated to Romania by the European Union. The Romanian State does not bear from its own funds the expenses related to the provision of these courses to immigrants (Ștefan, 2014).

Also, another major AMIF funding line targets the funds allocated to Romania to ensure the material conditions for accommodation, meals and daily living of asylum seekers during the examination of applications for protection. The National Center for Assistance and Protection for Asylum Seekers operates entirely from non-reimbursable funds provided by the European Union. Thus, operational expenses for maintaining accommodation infrastructure and ensuring basic living conditions for immigrants do not represent a budgetary burden for the Romanian state.

It should be mentioned that Romania fully uses the AMIF financial allocation from this budget exercise 2014-2020, the main direct beneficiaries being the General Inspectorate for Immigration and the National Employment Agency. Annual reports on the absorption of these funds indicate an implementation rate of over 95% of projects approved in this area. This is a sign that the financial management of programmes aimed at immigrants is being carried out in an efficient manner (Comisia Europeană, 2020).

Another source of external financing is represented by non-reimbursable grants granted to Romania by EU Member States or international institutions for pilot projects in the field of integration. Relevant examples in this regard are the grants allocated by Iceland, Liechtenstein or Norway, which provide funding for various projects implemented by institutions in Romania such as the General Inspectorate for Immigration or the Ministry of Labor and Social Solidarity. The implementation of these projects is also carried out without additional expenses from the national budget.

For the next period 2021-2027, it is intended to strengthen this model of external financing of programmes for immigrants, Romania will benefit from new AMIF and ERDF allocations. These European sources of funding allow an easier integration of immigrants into the Romanian labour market, without the state incurring direct costs in this regard. Thus, through the professional training activity supported by non-reimbursable funds, immigrants can quickly become a qualified workforce capable of covering some of the major deficits faced by some of the major deficits faced by some Romanian economic sectors (Comisia Europeană, 2020).

4. Romania's policies and programs for the economic integration of beneficiaries of international protection

Romania has developed an important policy framework to support the economic integration of beneficiaries of international protection. The National Strategy on Immigration for 2015-2020 established measures aimed at facilitating the access of these people to the labour market. Subsequently, these measures were updated through the National Strategy on Immigration in 2021-2024 (Europeană, 2020).

A key tool is qualification or retraining courses for employment. They ensure the provision of counselling, guidance and training services adapted to the migratory

context. For example, in 2021, approximately 1500 beneficiaries of international protection participated in professional improvement or retraining courses funded through the National Integration Program.

An important role is also played by local interventions coordinated by County Immigration Services in partnership with territorial employment agencies. These include career guidance programmes, scholarships for foreign apprentices and funding lines for start-ups and vocational workshops set up by refugees.

At local level, some county councils have launched pilot programs to provide microgrants to refugees, for education or entrepreneurial activities with social inclusion effects. Support for refugees' access to dual vocational education has also been increased.

5. Quantitative estimates of long-term fiscal benefits from effective refugee integration

While the immediate economic impact of refugee integration is felt mainly through integration spending, the long-term tax benefits can significantly outweigh these initial costs. To quantify the extent of these potential benefits, several studies have conducted simulations modelling the decades-long fiscal impact of integrating a certain number of refugees.

A study by the World Bank in 2018 estimated that integrating 1 million refugees into Europe would generate net tax revenues of more than \$25 billion over 20 years. During this period, refugees would pay more than \$33 billion in taxes and businesses would pay \$6 billion in additional social contributions, while the costs of the protection and integration system would be about \$14 billion (Mottaghi, 2018).

Also, a 2017 estimate calculated that the integration of 50,000 refugees would generate net tax revenues of about 500 million euros over 10 years, while integration expenses would be about 240 million euros. This would mean that, on average, each integrated refugee would generate a tax benefit of around €10,000 for the budget during their activity on the labour market (Alix-Garcia et al., 2017).

As refugees integrate in the long run, the tax benefits increase exponentially. A recent study by the Organization for Economic Co-operation and Development (OECD) estimated that integrating 100,000 refugees would generate additional revenue for a country's budget of about €60 million in the first 5 years and over €110 million over the next 15 years. Over 20 years, this influx of refugees would contribute almost €1.5 billion to the budget (Bevelander and Irastorza, 2021).

6. The impact of integrating beneficiaries of international protection into the Romanian labour market

The entry of beneficiaries of international protection into the Romanian labour market can generate both economic benefits and some challenges that the system needs to manage adequately.

One of the benefits of labour market integration is their contribution to filling skills shortages in certain economic sectors facing labour shortages. According to data

provided by the National Employment Agency, there is currently a significant shortage of personnel in areas such as construction, agriculture, food industry, tourism or medical care. The integration of refugees can help partially solve this problem through education and training programmes.

Another beneficial aspect is the diversification of the workforce in terms of skills and qualifications. Some beneficiaries of protection can bring complementary skills to the domestic labour market, such as knowledge of foreign languages or experience in certain fields such as IT. These skills can be harnessed by employers who need a flexible workforce.

In parallel, there are also socio-economic challenges to consider. Integration into the labour market often requires reskilling or reskilling refugees, entailing significant upfront costs. Also, lack of knowledge of international languages can make employment difficult. State institutions must implement integrated programs to support integration into the labour market and provide facilities to employers who accept beneficiaries of protection.

In conclusion, a balanced approach must recognise both the opportunities and challenges posed by refugees' entry into the labour market. Effective management of this process can maximise long-term socio-economic benefits for both employers and the refugee protection and integration system.

In our own research conducted on a sample of 2000 respondents in Romania, several questions were asked, some of which are also related to the economic field.

One of these questions asked for an opinion on the existence of a positive impact on Romania's economy of beneficiaries of international protection. Based on the answers to this question, it can be seen that there are divided opinions on their impact on Romania's economy.

The majority of respondents (56.5%) partially or completely agreed with the statement that immigrants have a positive impact on the economy. This includes the answer "I don't know/no answers". A total of 26.3% disagreed partially or completely with this statement. And 17.2% expressed neutrality with the answer "I don't know/no answers".

The results show a balance between the pros and cons of the positive impact of immigrants on the economy. Factors determining different perceptions may include the level of knowledge of the migration phenomenon, personal experiences, as well as political and social orientations.

Overall, opinions are divided, with similar weightings for each response category. To better understand the real economic impact of immigration, rigorous analysis and quantitative data by experts is needed, assessing both the benefits and possible long-term negative effects. Public opinion sometimes leans towards exaggerated or unfounded perceptions beyond the objective reality of figures.

Another question focused on the society's opinion on the labour market support provided by beneficiaries of international protection in employment for which employers find it very difficult to identify personnel from the national workforce.

Based on the answers to this question, it can be seen that the overwhelming majority of respondents (83.5%) partially or totally agree that beneficiaries of international

protection help fill jobs that are difficult to cover in Romania. Only 8.9% disagree with this statement.

The percentage of those who answered "do not know/no answer" is only 7.6%, suggesting that this issue is largely understood and accepted by public opinion.

Views are largely converging in recognising that their integration into the labour market can help overcome labour shortages in certain economic sectors. The more critical approaches are represented by the minority opinion that immigrants do not help fill hard-to-reach jobs in Romania.

Overall, the responses reflect the majority's belief that the access of beneficiaries of international protection to the labour market supports Romania in facing the challenges posed by labour shortages in some economic sectors. This is a pragmatic perspective that can contribute to the beneficial integration of beneficiaries of international protection into the Romanian labour market.

Another one of the questions focused on the society's opinion on the benefits of access of beneficiaries of international protection to the labour market, namely whether they consider that they "bring new ideas and/or stimulate innovation in Romania".

Based on the answers to this question, opinions are divided on the extent to which immigrants could stimulate innovation and bring new ideas to Romania. Thus, 41.7% of respondents partially or totally agreed that immigrants could have a positive impact in this regard. 31.3% did not have a clear position, answering "I don't know/no answer". And 27 percent partially or completely disagreed with the statement.

It can be seen that there is a significant dose of mistrust or scepticism about the potential of immigrants to contribute to innovation and the development of new ideas in Romania. At the same time, those who have a favourable position represent the highest percentage.

To better understand this topic, quantitative analyses would be needed on the ways in which immigration has influenced the development of economic sectors or scientific fields in other countries. Personal perceptions can have limits to explanations based on real data and concrete examples. A balanced approach should take both perspectives into account.

Also, within the same research, questionnaires were applied to beneficiaries of international protection and specialists in the field of integration. All 3 categories of respondents identify major difficulties in integrating beneficiaries of international protection into the Romanian labour market. Native-born society has mixed perceptions of migrants' ability to take up employment and find suitable employment. Migrants report significant obstacles in obtaining a suitable job and recognizing their qualifications and previous experience. Specialists recognize the importance of facilitating access to the labour market and the need for active policies in this regard.

According to data collected among migrants, only 46% are employed, and the main difficulty is the recognition of qualifications (around 40% of respondents). The authorities provide support for the equivalence of studies for only 1/3 of the applicants. Thus, existing skills remain untapped and employability is reduced. The development of clear and effective procedures for the recognition of qualifications is imperative (Goodwin-Gill, 2020; UNHCR, 2022).

Specialists say that policies to facilitate access to the labour market are insufficient in Romania. There is a need to simplify the recognition of qualifications, develop partnerships with employers, traineeship programmes and vocational counselling. Attracting the private sector and promoting diversity in the corporate environment can foster inclusion (Papademetriou and Benton, 2020).

7. Conclusions

Based on the results, it can be concluded that the integration of migrants is driven by several interconnected factors, from the socio-economic, legal and cultural spheres. The development of active multidimensional policies is necessary to support this process.

The results of the quantitative research applied on the three samples (society, migrants, specialists) show the following:

- There are divided opinions in society on the economic impact of migrants, and rigorous analysis is needed to understand reality.
- However, most respondents acknowledge that migrants can help tackle labour shortages in certain sectors.
- The high unemployment rate among migrants (over 60%) reflects real difficulties in getting into work.
- The main barriers identified by migrants are recognition of qualifications and limited access to Romanian language courses.
- Specialists consider that current policies to facilitate employment are insufficient and require a more active approach from the authorities.

Based on the data collected, it can be concluded that the professional integration of migrants still faces numerous obstacles in Romania. Monitoring public attitudes and developing measures appropriate to migrants' real needs are necessary to optimize this process.

At public policy level, the introduction of the following recommendations could enhance successful integration:

- Improving access to education and language courses Romanian
- Simplifying procedures for the recognition of professional qualifications
- Stimulating employment through programs dedicated to the labour market
- Supporting autonomous housing and social relations with the community
- Permanent monitoring of migrants' needs for policy evaluation

The most important issues that should be addressed in future research concern:

- Impact assessment of existing labour market integration Programmes and measures
- Identifying barriers to refugees' access to suitable employment and career development
- Studying ways to boost long-term employment

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WHY SHOULD I STUDY IN ENGLISH? STUDENTS' PERCEPTION AND MOTIVATION

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Abstract. *In the context of globalized society, the education offer seeks to prepare young people to adapt as best as possible to the demands of the labour market. The best possible integration of young people into the labour market takes into account both opportunities on it and important decisions that they make to increase their chances of a good job. In an internationalized environment, the chances of a good job increase if the employee has a good knowledge of the concepts in an international language. The specialized literature offers various analyses and approaches regarding the motivation of young people to choose to access university studies in a second language. In order to find out what are the students' motivations for choosing to study business administration in English, we conducted 13 interviews with first year bachelor students from the Faculty of Economic Sciences of the University of Oradea. In our research, through semi-structured interviews applied to first year students who study in English, we aimed to highlight their opinion on the following topics: choosing the program in English, evaluating the educational offer or expectations related to the workplace and career opportunities. The students' answers are a good indicator of the perceptions regarding the motivation to choose to study in English. The motivation to study in English starts from the knowledge of the English language and extends to the opportunities that the study of business administration in English offers in relation to the future career. They are eager to find a job in Romania, but they will not refuse an opportunity in another country, if such an opportunity arises. Students' motivations and perceptions regarding education are an important indicator to have a more realistic picture of their expectations of the education offer as well as their integration and success on the labour market. In our future analyses regarding students' perceptions of the choice of studies, we will seek to expand the analyses both by specializations and by years and level of studies.*

Key words: business studies, second language, study opportunities, students' perception, labour market.

Jel codes: A11, A22, F66, I23, J24.

Introduction

Internationalization is one of the main priorities of universities (Roga, R., Inga Lapiņa, I., Mürsepp, P., 2015), an integral part of their strategies, thus contributing to the development of study programs in English. Higher education is an important source of income in many countries of the world. If until recently, the top destination countries of international students (Ahmad, A.B., Shah, M., 2018) were the USA, Great Britain, France and Australia and countries from which the most international students are recruited were countries from Asia, China or India, now a new trend is emerging. International students choose universities in China. Studies on the motivation of international students choosing to study in China are related to the distinctiveness of the Chinese language, the rise of the country's universities in global rankings, and the country's economic growth.

Factors determining learning in a foreign language

Learning motivation (Wang, J. N., 2016) in a foreign language has been an important topic of scientific analysis for the past 20 years. Studies on this topic have brought clarity to many aspects. The motivation to learn business in English increases (Wang, J. N., 2016), according to the linguistic pedagogy approach, and by the fact that learning English is done through collaboration and meetings, presentation and problem solving (Kumisbayeva, M., 2013). Hung, N.T.(2021). Qualitative and quantitative studies, which analyse the factors and motivations of international students to attend university and postgraduate courses in Asia or Taiwan, show that students' motivations and career planning are significantly correlated, both factors directly affecting the decision-making process. Mazzarol, T. and Soutar, G.N. (2002) describe a push-pull model of students choice to study abroad. The studies analysed show us that, in destinations such as Indonesia, Taiwan, China or India, the economic and social reasons in the country of origin are factors that lead students to choose studies abroad. They choose the most suitable country for them based on various attractive factors.

Building on extensive qualitative and quantitative analyses of the factors that determine international students' choice to study in the US, Judith Eder, Wayne W. Smith & Robert E. Pitts (2010) identify three driving factors (personal growth, language and career) and three pull factors (faculty details, geographical factors, and US culture). Empirical studies and analyses (Barus, I., & Simanjuntak, M., 2020) show that students perceive learning business concepts in English through a continuous repetition exercise structured on elements such as: language, usefulness, clarity, pleasure, efficiency, comfort and content. Haoda Sun & John T.E. Richardson (2016) show that there is a causal relationship between variations in their perception of the academic environment and variations in their learning behaviour that influence students' motivation to choose to study in English. Studying abroad is becoming more and more common. According to Presley, A., Datha Damron-Martinez & Lin Zhang (2010) attitude, perceived behavioural control and subjective norms are significant predictors of students' intention to pursue English language programs. According to Hovdhaugen E., Wiers-Jenssen, J., (2023), students' motivation to study in another country has also been analysed from the perspective of gender, social origin, field of study and mobility capital.

For young Europeans who enrol in higher education programs, studying in another country is an option they can easily use through Erasmus programs (Teichler, U. (2004). Despite some socio-economic barriers that can make access to Erasmus type mobilities to be more restrictive (Otero, M.S., 2008), adjustments are constantly made so that the offer addresses as many students as possible interested in the opportunity. Studies conducted with former Erasmus students show that they do not excel later through higher income or social status at the beginning of the career. Erasmus mobility in a European country remains (Teichler, U., & Janson, K., 2007) a valued professional experience for students from Central and Eastern European countries. The benefits that are brought to students by the Erasmus mobilities can be measured, as Cuzzocrea, V., Krzaklewska, (2023) have also achieved, by the number of mobilities completed by the student.

So, we have a topic of interest for the academic community that will continue to be approached from various angles of analysis. For some countries, the subject is newer, as it is for our country. Seeking to have a more comprehensive picture of our subject of investigation, we consider appropriate to analyse a number of 285 articles from webofscience.com that have as their topic *business learning in second language*. Using the VOS viewer bibliometrics software, with the article's title and abstract as analysis content, the results (Figure 1) are grouped into three large cluster of concepts.

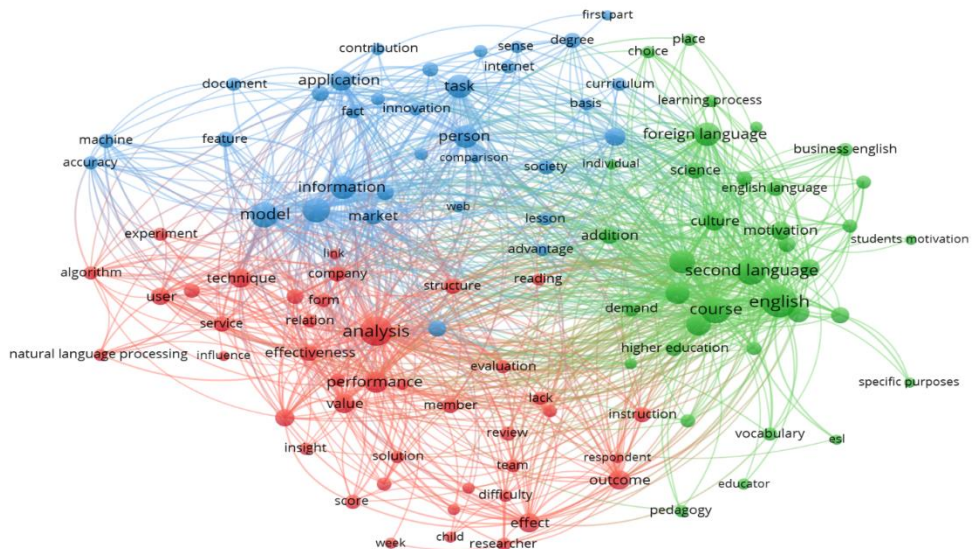


Figure 1. Concepts representation

Source: Our analysis in VOS viewer

The concepts grouped in the three clusters represent, on the one hand, the multitude of notions used in the articles that deal with the subject of business learning in a second language, and on the other hand, their grouping into clusters allows us to understand the context in which these concepts are used. The frequency with which these notions are used is also represented by the size of the point. The cluster which is represented by the green colour has concepts that come to describe the learning context through notions such as: English, course, second language, science, foreign language, higher education, vocabulary, culture, motivation, addition, business English or pedagogy. The second cluster, which is represented by the colour blue, groups concepts such as: information, model, task, market, application, fact, innovation, lesson, advantage, contribution, internet, machine or accuracy. In the third cluster, represented by red colour, we may find the following concepts: analysis, reading, performance, effect, difficulty, researcher, member, instruction, value, technique, outcome, natural language processing. Although the described clusters illustrate the frequency of various concepts, the fact that they are grouped into three categories helps us understand in which combination they are used in scientific articles. Thus, in the green cluster we find grouped notions that describe the subject, respectively learning in the second language, the second cluster includes elements that describe extrinsic factors of learning and the red cluster follows intrinsic characteristics of learning.

The purpose of our research is to analyse the factors that influence our students' choice to study business in English.

Methodology

This study represents the quantitative and qualitative results of an analysis of semi-structured interview, having as a target group the first-year students, Bachelor's degree of the Faculty of Economics, at Business Administration program in English. The interview was a face-to-face one and it lasted for approximately 30 minutes. The questions took into consideration the reasons for choosing the program in English, the assessment of the learning process and the expectations regarding the students' careers. The interviews were analysed through QNR Nvivo and Gephi softs.

The participants selected in our sample of analysis were chosen by means of a theoretical sampling. In the process of information gathering we applied the rule of theoretical saturation in qualitative research (Sanders et al 2018); this rule of qualitative research is not subject to the requirements of statistical representation, the sample being considered enough when the interviews do not add anything else to the level of information.

The interview guide included several subjects: English language, choice and use, educational content, work place. The questions are related to every theme and they can be found in the table below (Table1):

Table 1. Themes and questions of the interview

Theme	Question
The choice of the program in English	<ol style="list-style-type: none"> 1. Why did you choose the program in English? 2. Did you take into consideration choosing another faculty? 3. Did you take into consideration to attend another specialization's courses at the Faculty of Economics?
The assessment of the educational offer	<ol style="list-style-type: none"> 1. The courses offered by the faculty meet your expectations? Yes/No. Give reasons. 2. Did you attend activities or scholarships (e.g. Erasmus+) in which you practiced communication and learning in another language? If yes, give details of the context. 3. Do you have life contexts in which you communicate in English, some other ones than at the courses of the faculty?
Expectations regarding career opportunities	<ol style="list-style-type: none"> 1. Will you search or are you searching for a place of work in the field of your degree? 2. Do you think that your current job is more prestigious, better paid and more interesting due to the graduated program in English? 3. Do you want to work in Romania? Yes. No. Give reasons.

Q1. Why did you choose the program in English?

The respondents talk about the choice of studying in English in terms of opportunity and perspective. If some of them underline the idea that the choice of studying in English is due to the fact that they know English, we also have the respondents who see in attending the program in English an advantage that will help them in the labour market. Thus, a student says: 'I have chosen to study Economics in English because I am sure that it will offer me more opportunities in the future but also because I feel that I need to take advantage of the knowledge in English that I have accumulated during high-school years.'

The opportunity that the students see in the fact that they already master the English language is expressed by a student who says 'The reason for my choice to study in English is the fact that I wanted to develop my communication and learning abilities in this language.' Or, another student says 'I have chosen to study in English because I wanted to have one more challenge, because to study in Romanian seems

very easy to me and because studying in English, I can have more opportunities in the future.'

On the other hand, the majority of students perceive this opportunity of studying business in English as a cumulative advantage, as an opportunity and perspective. 'I have chosen the program in English because I have always liked to study in a foreign language and practice it. I also have a Cambridge certificate in English and I want to take advantage of it. Studying in a foreign language makes me feel like I study abroad.' Another student says that 'The reason for choosing this program is the fact that I have always liked foreign languages, especially English. Moreover, I wanted to take advantage of my certificate in English and to enlarge my horizon regarding a future work place, maybe abroad.' Another student considers that for the large number of advantages, among which he mentions the practicing of the English language, possible connection with companies and people from other countries and the variety of the possible work places.

Q2. Did you take into consideration choosing another faculty?

A significant proportion of the students say that they have also considered the choice of another faculty. Thus, an answer is: 'Yes, I have considered going to the Faculty of History', or 'Yes, until the 12th grade I wanted to study Informatics but I changed my path because I considered that it was not what I wanted to do in life'. On the other hand, the students who did not take into consideration another faculty said that 'No, this was the first faculty I was thinking about since I was in high school'. The program in English is appreciated by the students in comparison with another specialization which is taught in Romanian'. I am enrolled at another program in Romanian, too, at the Faculty of Economics, Finance banks but I like more AAE program'.

Q3. Did you take into consideration enrolling to other courses, at another program, in the Faculty of Economics?

In the majority of cases the students say that they did not take into consideration enrolling to the courses of another specialization in the faculty. Their choice was defined by a student, as follows: 'I didn't think of enrolling to another program since I felt that this program is exactly what I need for my future career.'

Q4. Do the courses offered by the faculty meet your expectations? Yes/No. Give reasons.

Regarding the topic of assessing the program in English, the answers are complex and varied answers. The courses are appreciated regarding the way they are taught but also regarding their content. 'I consider that the majority of the teachers have good intentions and they are willing to give valuable advice to the students, The courses are interesting and different from the ones which were taught in high school'. Their expectations are regarding the practical part of the courses and the applicability of the theoretical notions that they learn. They expressed these appreciations as follows: 'The courses offered by the faculty are according to my expectations so far. In the future, meaning in the 2nd and 3rd year, I would like to have more practical

courses. Other students said that 'I would like the courses and the activities in the faculty to be more practical ones, because my program is named Business Administration and here, we learn more how to be an employee, rather than how to run a business of your own'.

The students mention some aspects that could be improved, referring to the teaching method, the aspects regarding the teachers' knowledge of English and the actuality of the didactic content. 'Yes, the courses are good. The syllabus of the courses and seminars are in concordance and they seem to be suitable', or 'As far as I am concerned, the content of the courses is very good but their presentation could be changed a little bit'. Another student said 'No, I consider that the majority of subjects are old-fashioned - there is no correlation between the events/the changes of the present and the courses. I consider that there is a need to study the way the Small and Medium-size Enterprises function / the management authorities', and 'No, I feel the need of more applicability' or 'Yes, I would like some teachers to speak better English than they do'.

Q5. Did you attend activities or scholarships (e.g. Erasmus+) in which you practiced communication and learning in another language? If yes, give details on the context.

Although only three of thirteen interviewed students say that they had a learning experience in another country, 'I had the opportunity of spending three weeks in Cyprus, part of an Erasmus program', but also, 'Yes, I attended an exchange program with a school in Germany', they express the interest and desire of having this type of experience 'I would like to attend a future Erasmus program'.

Q6. Do you have context in which you communicate in English, others than the courses of the faculty?

The communicational contexts in English are diverse and frequent. Communication in English is found even in the family, according to what a student says 'Yes, I practice English a lot. I attended Olympiads and I took the Cambridge exams. My mother and my grandmother are teachers of English so I practice my English a lot' or another student mentions 'Yes, I communicate in another language every day, more exactly in English; in different contexts, with different people, some of them being friends or even family members'.

Another context described by the interviewed students is connected to the communication with the foreign Erasmus students. 'Yes, with an Erasmus student', or 'Yes, with some Erasmus students', but also 'Yes, with a colleague who came from Italy with the Erasmus program'. Some other contexts mentioned by these are connected to their visit abroad or by online gaming 'Yes. I was abroad and I practised my English there' or 'I communicated in English only by means of exercises and video games'.

Q7. Do you want to search for a job in the field of your degree?

The majority of students intend to search for a job in the domain of their degree 'Yes, I search for a job in the field of my degree. I hope that the graduated program (in

English) will represent an advantage in the moment of the interview for a job, in the field of Economics', also another student says that 'I already work in the wanted domain, I want my Bachelor's diploma just in case this becomes a condition at my job. I have chosen first my job and after that the faculty, this is why I don't rely very much on finding a job in accordance with the graduated program. Shortly, It has been a favourable context'.

The ones who consider that they do not want a job in the domain of their degree say that they will use the knowledge they got by attending the graduated program 'No, there is no passion about it. It was a challenge for me and in the same time it was a thing that arouse my curiosity. In the meantime, it is a 'help' for the future job that I want'.

Q8. Do you think that the job you will have will be more prestigious, better paid and more interesting due to the program you graduated in English?

The students have hued answers regarding the prestige of their future job. From their answers we can detect their maturity and realism 'Regardless of the attended program, in Romanian and English, your work will start at the lowest level. Without experience, nobody gives me the deserved salary. I am content with the fact that I start at the lowest level and I hope that the Bachelor's degree will help me at the salary scale' or 'I hope that graduating a program in English will have its advantages in the future. It will perhaps open some new doors, but I can't say that it will bring me more money' but also the potential and the opportunity. 'Yes, it opens the way to more possible jobs not only in Romania but also in other countries.

Q9. Is your desired job in Romania? Yes/No. Give reasons.

The students say that they want to stay in the country for different reasons, because of personal reasons 'Yes, I can't see myself working in another country' to appreciations regarding the job opportunities from the country's economic level of development 'Yes, I want to work in Romania because I think that Romania is the country of all the possibilities', or 'Initially I was thinking of going abroad, being attracted by the salaries but I decided to see how the labour market in Romania is and to gain some experience' or 'Yes, because I consider that in Romania there are a lot more important domains at their beginning, so a new beginning can be successful'. And another student says that 'Yes, because of the fact that Oradea is a continuously developing city and I consider that it has a proper environment for a business in Romania' or 'It depends on the opportunities I will have + the economic situation of the country in that moment. Now I want to be an employee at a foreign employer, but I want to work in the country'.

The respondents also take into consideration the possibility of getting employed abroad in the future. 'Yes. At first, I would like to work here, but later, after graduating, I would like to work abroad, if I have a better offer', or 'Yes, but regardless of this, I wouldn't refuse the opportunity of working abroad at the same ideal job'.

Discussion

In this paper we tried to make a first analysis regarding the motivation of our students to study in English. Starting from the concepts and analysis derived from the literature review, we have grouped our questions addressed to our students into three categories that refer to motivations, perceptions and expectations that students have in relation to their chosen specialization.

Conclusions

A lot of universities, all over the world, have internationalization as an important part of their strategy. The countries that attract a lot of students are those countries which offer interesting programs and job opportunities to future graduates. The motivation of learning in a foreign language (Wang, J. N., 2016) represents an important subject for scientific research that has been going on for more than 20 years. The studies undergone regarding students' motivation (Mazzarol, T. and Soutar, G.N., 2002, Judith Eder, Wayne W. Smith & Robert E. Pitts, 2010) describe a 'push-pull' model for the student's choice to study abroad. By analysing the answers of our students, we wanted to underline the elements that motivate them in their choice of studying business in English.

The students' answers are a good indicator of the perceptions regarding the motivation to choose to study in English. The motivation to study in English starts from the knowledge of the English language and extends to the opportunities that the study of business administration in English offers in relation to the future career. They are eager to find a job in Romania, but they will not refuse an opportunity in another country, if such an opportunity arises. Students' motivations and perceptions regarding education are an important indicator to have a more realistic picture of their expectations of the education offer as well as their integration and success on the labour market. In our future analyses regarding students' perceptions of the choice of studies, we will seek to expand the analyses both by specializations and by years and level of studies.

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LEARNING BUSINESS ENGLISH – NEW CHALLENGES AND METHODS: FROM COURSEBOOKS TO TECHNOLOGY BASED STRATEGIES

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Abstract: Being a trade language and a diplomatic one, used in business, science, aviation, computers, tourism, diplomacy, actually, in all the fields of our lives, English is the third most widely spoken language in the world, taught in 118 countries. Thus, acting as a communication language across the globe and having a huge influence in the business field, we are facing the expansion of international relations in various spheres, requiring future university graduates a competency-based approach to mastering Business English. Language education policymakers have incorporated English in higher education syllabuses in order for the students to become proficient in English, having different pedagogical methods and motivational techniques. In this article we are trying to describe our perception on how to shape the students' motivation to study Business English, by using new techniques and more attractive methods. Human behaviour can be shaped and influenced in a wide variety of ways, ranging from incentives and rewards, considered to be external motives and continuing with the internal motives, which are represented by the wide spectrum of reasons for doing things: people can be motivated by the love of power and money, the love for others and the world around us or the love of peace and freedom. And because of the complexity of life, in general, several of these motives can affect us simultaneously, interacting with each other. When talking about mastering Business English, the same situation occurs. The students' ultimate success always depends on the level of motivation. And this motivation has been the target of intensive research in Business English acquisition for a long time. The article begins with a theoretical approach describing the problem under discussion, continuing with some suggestions of pedagogical conditions that make effective impact on increasing the students' motivation and adding some ideas of materials to be used in class.

Keywords: Business English; motivation; communication; teaching methods; language acquisition, Artificial Intelligence.

JEL Classification: Y8, Z19

A trade language, the language of diplomacy, business, science, aviation, computers, tourism, and socializing, English has become an extremely important subject to study in universities all over the world. Being taught in 118 countries and being the third most widely spoken language in the world, the importance of mastering English is no longer an issue to be discussed. In all the aspects mentioned above, English must be mastered; the need to attain language proficiency in order to excel in various aspects is more obvious than ever. All the countries where English is taught incorporated English as part of the syllabus, by having different pedagogical methods and motivational techniques in order to improve the students' proficiency in the English language. Mastering English gives students, the opportunity to reach their desired goal and objectives easily. From another point of view, having employees who are proficient in English gives multinational companies the opportunity to compete globally. Being a branch of English for Specific Purposes, Business English is designed, based on the specific needs related to the Economic environment, apart from English for law, for doctors, for engineers, and so on.

In the modern world, more exactly in the era of social networking and all kinds of gadgets at hand, learning a foreign language may seem an easy task to achieve, at first sight. However, if we take a closer look at the issue under discussion, we will understand that things are not as easy as they seem. During the years, learning methodology of Business English has gone through various periods in which it has evolved, being the focus of many experts who have continuously striven to find new and improved ways of learning Business English. Researchers have given a large range of prognosis and explanatory studies, providing a vivid image on the potential future lines in the higher education sector. The enormous progress of Information Technologies is having a positive effect on teaching and learning Business English, the main focus being on the continuous development in mobile software and hardware and the way these new methods have blended with the traditional methodology, in order to achieve the expected results. Due to these aspects, collaborative learning has acquired a new dimension; the huge advantage is the great exposure to authentic language, the unlimited access to a wide source of information and the opportunities to interact and communicate more intensively.

Many researchers have used the method of collaborative learning, when promoting new ways of teaching Business English. (Kirschner 2001, Storch 2005, Hafner and Miller 2011, etc.) Generally speaking, the students enrolled at Economics prefer to use technology in their daily activities, thus technology representing an important tool in teaching Business English. As Hafner and Miller said in 2021: *'Recent advances in Information and Communication Technologies, including the development of various Web 2.0 platforms have contributed to the emergence of new literacy practices in online contexts.'* As we all know, the students of today's universities are mostly 'Digital natives' and they are entirely different from the previous generation. In higher education, and not only, we are at a time of change, new learning experiences becoming more and more engaging, meaningful and relevant. The use of the instant messaging apps, such as WhatsApp, Viber, Messenger,

etc and the different digital social media such as Facebook, Blog, Twitter, etc gives them the possibility to interact with family members, friends and whomever they want. Similarly, they use the latest technological findings, such as Moodle and different applications in order to achieve their educational goals. If a teacher wants to fully motivate his/her students in grasping a new lesson, the teacher will strive to find innovative ways to do it. It has been said, during the years that 'a good motivator, automatically is a good teacher, and a motivated learner will eventually become a good student' (Ushioda, 2008). Moreover, university teachers have to conform to the trend of the times and to the demand of the students and integrate as much as possible elements of technology with the aim of professional teaching. The above-mentioned picture provides us with what we need for the following strategies, in order for them to be properly applied. From the digital perspective, there are three main directions that will gain more and more space in Business English teaching: the Virtual Reality, the Artificial Intelligence and the Metaverse. It may sound quite strange but the truth is that these three directions are here and they are developing really fast. The concept of Virtual Reality encompasses the idea of a computer-simulated 3D situation, a virtual real-life environment in which the learner can immerse with the help of some 3D googles. The Artificial Intelligence direction is the one where computers execute tasks that normally need human intelligence. *'The Metaverse is an online, open, shared, persistent, three-dimensional virtual realm that offers people to connect with each other from all parts of their lives. It would link many platforms, same as how the world wide web connects several websites using one browser.'* (Blockchain Council) From our point of view, the Metaverse is the most likely to gain interest both among teachers of Business English as well as among students at the Faculty of Economics. Why? Basically, Metaverse allows you to enter a world which looks exactly like real world, creating virtual classrooms and situations in which both the teacher and the students can interact in real-time. The virtual environments can be created to simulate real-world situations in which the students are active and 'real' actors who need to practice their speaking skills, practising their Business English in a realistic context. Another way of using this digital tool in Business English classes is for the teacher to create a social metaverse where students can meet directly native speakers, practising their listening and speaking skills while interacting with virtual characters. Thus, the possibility of creating real-life contexts in Metaverse is a huge opportunity for Business English teachers and students all over the world. Due to the extraordinary developments in the computer industry, three-dimensional modelling and the Internet, the new learning methods and techniques, both for students and for teachers, are somehow a necessity rather than a need, learning being moved to a different dimension in all fields of study.

The question that arises is the following: when will this be possible? How soon will teachers of Business English in Romanian universities use Metaverse in their courses? The answer is: not very soon. Despite all the hype of the moment, in order to use these tools, the equipment needed in order to put this in practice is a pretty sophisticated one, requiring financial resources as well as a lot of knowledge in the field of technology. Besides the benefits

of the new trends, of course, there are some possible downsides. We will present them and we will try to compare the level of their effect on developing the methodology of teaching Business English. Although the current trend can be characterized in one word, that is tech-dominant, there are two more ingredients to a successful Business English course: a positive learning environment and an excellent teaching approach. There are four strategies that are suggested for the teacher to apply in the classroom: firstly, find the proper method to a high exposure to what we learn; secondly, make use of what the students have acquired in communication with others; thirdly, pay attention and become more reliable in the usage of the particular knowledge; lastly, put into practice the theoretical information, as much as possible. The question is how do we, teachers, achieve this goal as every student is unique and the given language needs to be used in real-world environments?

We suggest approaching one or more teaching strategies, which are considered to be the most appreciated strategies in teaching Business English today.

- **Personalized Learning**

According to Atikah Shemshack, learning is *‘a natural human activity that is shaped by personal experiences, cognitive awareness, personal bias, opinions, cultural background, and environment. (...) Learning is a personalized experience that allows one to expand their knowledge, perspective, skills, and understanding.’* Personalized learning has been a topic of discussion for a long time. The use of this term goes back to the 1960s and all the enthusiastic users of this method have come to the conclusion that there is no common definition attributed to this method of learning. However, beginning with 2008, this method of teaching/learning Business English has started to gain more and more attention. But basically, we talk about an educational approach in which the teacher aim is to tailor the instruction to the students' needs and abilities. The significance and effectiveness of this method have been emphasized by the recent changes in the curriculum and pedagogical approach in comparison with the traditional way of teaching. Personalized learning *‘heralds a new way of dealing with individual differences by effecting as precise a dialogue as possible on each language learner, thus triggering specific interventions designed to target and respond to each person’s specific language learning problems.’* (Liam &Sangarun, 2017) To say it in other words, personalized learning is an important and valuable method to precision language education, which has become a crucial topic of current interest when talking about technology oriented learning/teaching.

- **Gamification and role-playing**

Around 2010, when the technological developments were having a rapid pace, the world of education witnessed the emerge of a new term – gamification. It is a non-game-based teaching method which has become increasingly popular among teachers of Business English. As Hadirotun Nikmah points out, by gamification teachers can improve the students' engagement in learning English; the choices offered by the technology varying considerably the teacher of Business English can make the class more attractive and also more productive when it comes to refinement. Thus, a

boring seminar atmosphere can turn into a more enjoyable, comfortable and motivating one. Tara and Samer claim that *'gamification and role-playing motivate students through a magic formula of fun and meaningful learning that can be attributed to the design elements of the game varying from points and levels for rewarding and ranking to incentives and badges to challenge and excite.'* When teaching Business English, we can accept and recognize the use of different technological tools that enhance the learning process, providing a full and reliable support. Moreover, teachers can get an aid in creating a true business English learning atmosphere, great convenience and fun in the process of learning, since the use of technology can somehow avoid the embarrassment in students' practice and improve the communication skills more easily. Some apps can be used as teacher assistants providing the class with sentence patterns and fixed collocations for practice activities, which can be of great help. The concept invites users to be more involved in solving a problem, having different levels, a scoring system and a wide range of tools focusing on learning. The concept is divided into three categories: the internal one, which is gamification aiming the increase in productivity, by creating new innovative projects in business and organization. The external gamification uses outside-company firms or organizations, aiming to improve the relationships between different companies, between business and customers, increasing the profitability of the enterprise. The third level of gamification is entitled behaviour-change gamification, having the aim to form a new habit against a person.

- **Project-based Learning**

In recent years, teachers of Business English have been trying to provide students methods of learning/teaching engaging both cognitive skills, namely hard skills and problem-solving and teamwork, namely soft skills. However, this goal is not easy to be achieved as the role of traditional learning has been prevailing for so long. It's rather difficult to achieve these skills related goals as the role of the teacher has been known for so long as 'the transmitter of the knowledge' while students act as 'the receptors of the information'. The fact that the students have been encouraged to focus on the cultivation of their research skills rather than on the professional ones, led to a deep gap between what students learn at the university and what they actually need in real-life situations at their workplace. In order to change this, researchers in the field suggested the engagement of the students in real-problem solving and knowledge construction in authentic professional contexts. Project preparation and presentation represent an attractive and challenging way to achieve this goal. This method is a way of learning which is based on the hypothesis that students gain a deeper and better understanding of the material when they actually build and work with their own ideas and concepts on a given topic. It is an active form of instruction, being centred on the student. The more communicative, autonomous, willing to collaborate the students are, the better the outcome is. Moreover, the presentation of the projects implies thorough preparation, constructive investigations, goal-setting, practice, real-world practices, confidence and real-world practices. Researchers in this field have come to the conclusion that modern digital technology, group processes and the teachers' ability to

provide guidance and support can be used as facilitating factors in the implementing of this teaching method. Thus, students are challenged to drive their own learning through a lot of collaborative work, inquiry, creating the projects that can easily reflect their knowledge and interest in the field. The transversal skills that are employed in this activity prepares the students for the real-world challenges they might face in their future career, by combining motivation and acquisition of knowledge.

- **Flipped seminar**

This term has become synonymous with active learning for some researchers. Why? Because it engages students in learning, more than just listening, reading, and memorizing, including collaboration between students (either in pairs or in groups) as well as independent activities involving reflection and writing. The definition of this term is *'a flipped classroom is an instructional strategy and a type of blended learning, which aims to increase student engagement and learning by having students complete readings at home and work on live-problem solving during class time.'* (Wikipedia) This strategy is valuable and appreciated both by teachers and students for several reasons among which we mention: the students can estimate their own understanding, the students can collaborate with their classmates, thus enhancing their sense of belonging as well as motivation, and the teachers can get feedback about what the students are learning, providing better guidance in the learning process. The teacher's approach in this method should be following these steps: find or create and recommend resources for students, suggest activities and teach students how to use their material.

- **Collaborative learning**

According to Wikipedia, *'Collaborative learning is an educational approach to teaching and learning that involves groups of learners working together to solve a problem, complete a task or create a product.'* A major component of this method of teaching/learning is the training of the students in their social skills, so much needed at their future workplace, building positive relationships, encouraging diversity understanding and promoting positive social responses to problems encountered during the activity. Another major component of this approach is that the students are committed in the learning process, working together and being taught how to challenge ideas and advocate for the wanted positions without too much personalization on the statements. While working together, both the active part (speaker) and the passive part (listeners) involved in the process, develop valuable problem-solving skills by formulating ideas, discussing them, receiving immediate feedback and giving answers and comments. This way, the oral communication skills are developed, the students being actively involved in the cooperative process which leads to deep learning rather than to surface learning. During this activity, the teacher has the opportunity of assessing students from different points of view, such as interaction, explanation of the reason, asking questions and discussing ideas and concepts. Compared to individual effort and competitive strategy, the collaborative learning method provides numerous advantages such as higher achievement and greater productivity, as well as greater self-esteem, psychological health, and social competence.

Conclusions

As English has expanded tremendously in the last decades along with the technology that has been at hand, Business English teachers have to adapt their work to the current trends if they are to achieve successfully their goal of developing all four skills in their students. The required goals of learning Business English may not be achieved by using past methods, which are neither productive nor creative and constructive. The new technological advancement has created the proper ground for more improvement, more effectiveness and efficiency in our attempt to be better and better day by day. Business English teachers can achieve a fundamental transformation of the courses' outcome by breaking through the inherent teaching ideas and using the technological development that is at hand.

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VIDEO STREAMING PLATFORMS FOR LEARNING ENGLISH - CASE STUDY: NETFLIX

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Abstract We live in an age of technology when people increasingly give up on television and turn to online streaming sources to entertain. These services provide an alternative to cable and satellite on-demand service, sometimes at a lower cost. Due to its intense development over the last few years, video streaming technology has attracted academic attention as a valuable tool for learning or improving English. Thus, this study discusses the practicality of video streaming use in foreign language higher education. It starts with a brief review of the literature on the use of video for language learning, focusing on the main benefits for learners. Then, the study presents the video as a learning tool underlying its advantages over the other previous physical technologies. To highlight the value of video streaming to language education, benefits and problems are explained, and Netflix is outlined as an example of a streaming video platform that may be used within English language teaching. General vocabulary items will be acquired, and listening skills will be improved. However, the interest in studying and approaching new topics focusing on specialized vocabulary will be recognized as an advantage when utilizing video streaming platforms. Next, specific strategies for using video streaming platforms will be outlined. The first was that short documentaries could be watched along with multiple-choice questions to promote general vocabulary building. The second is that Netflix's series or movies can be utilized to find specific themes to help explain particular grammar or vocabulary points while improving the specialized business vocabulary.

Keywords: learning English; video streaming platforms; business vocabulary; skills.

JEL Classification: F12; J11

1. Introduction

According to dictionaries and specialists, video streaming is described as “a continuous transmission of video files from a server to a client. It enables users to view videos online without having to download them.” (Gillis, 2023) or as “sending media content in a continuous stream of compressed data over the Internet, which is displayed to the viewer as soon as it arrives” (AQR); it comes from the term

“streaming” being “the activity of listening to or watching sound or video directly from the internet” (<https://dictionary.cambridge.org/dictionary/english/streaming>).

The concept of honing your English skills through Netflix aligns with one of the oldest principles of language acquisition: the most effective way to learn a language is through listening. This method aids in transitioning language from the left side of your brain to the right side, where your native tongue is stored. Netflix has enhanced this approach by offering a variety of new tools that enable you to enrich your existing English language abilities simply by enjoying your preferred films.

2. Literature review

Learning foreign languages for international communication, especially for academic and business purposes, has never seemed so crucial. Foreign language competencies are mainly required for students and graduates who choose to work in multinationals or an international context. However, in higher education, there is not much space to learn foreign languages as part of the primary curriculum – except for a few specializations that allocate more classes to foreign language teaching – thus, students lack sufficient exposure to successful language learning. (Richards, 2015; Trinder, 2017; Tsou et al., 2006).

Video streaming and other out-of-the-class activities have consequently been considered reliable allies in the process. During the past decades, the effect of audio-visual input on second language learning has been studied from different perspectives, even if research on the application of live streaming in foreign language learning is relatively limited, especially in Romania.

Research has focused on questions related to the role of video streaming platforms and TV programs (documentaries or series) for *incidental vocabulary learning*, suggesting that this approach can effectively stimulate different language learning, encompassing areas such as comprehension and vocabulary acquisition (Rodgers, 2018; Peters & Webb, 2018; Pattemore and Muñoz, 2023). Moreover, research suggests that watching television and video platforms may positively impact learners' listening and reading proficiency, as noted by Lindgren and Muñoz in 2013. The alternative audiovisual input immerses learners in *authentic language usage* (Lin, 2014) and thus adds extra value to the leisure activity as studies reveal a “strong correlation among the development of listening, reading, writing and speaking language skills of experimental group students whose English listening skills have improved by using authentic videos.” (Polat and Etisti, 2019). Considering authentic language material “any material in English which has not been produced explicitly for language teaching” Taylor (1994), video streaming exposes the language learners to the most effective types of authentic audiovisual materials and could significantly enhance their language proficiency (Bahrani, Tam, and Zuraidah, 2014). Video streaming creates an interactive learning environment for viewers and conveys cultural content, enriching the educational experience. (Stilborne & MacGibbon, 2001; Hartsell & Yuen, 2006).

Researchers also discussed another facet of learning through watching, namely the effect of watching foreign language programs and films with *captions* showing that

it enhanced learners' phonetic retuning, vocabulary acquisition, and listening comprehension (Mitterer and McQueen, 2009; Vanderplank, 2019).

Another aspect considered by linguists refers to the potential of video as a tool for language learning from a *motivational approach*, and data reveal that watching television and videos in a foreign language as extracurricular activities has increasingly become popular among learners, having a beneficial influence (Kuppens, 2010; Lindgren and Muñoz, 2013, Peters & Webb, 2018; Kanellopoulou and Giannakouloupoulos, 2021).

3. Benefits and shortcomings of using video streaming as a learning tool

With advances in software and networking technology, video streaming has become more accessible, more effective, and beneficial for language learning. Video streaming platforms are often seen as valuable additional tools for language learning, but they may not replace the need for structured language courses and interactive practice. Nevertheless, integrating video streaming into the learning process rallies foreign language learning to the demands of globalization. It soothes its adaptation to the present needs: self-directed learning, self-paced study programs, and authentic language learning experiences. As a resulted from the literature review, among the numerous advantages of integrating video streaming into the language learning process, we can summarize the following:

- a) *Improved Listening and Pronunciation*: Video content helps learners develop their listening skills and enhance their pronunciation by exposing them to authentic spoken language.
- b) *Visual Context*: Videos provide a visual context that aids comprehension, making it easier for learners to understand the meaning of words and phrases.
- c) *Cultural Awareness*: Video materials often incorporate cultural elements, allowing learners to gain insights into the culture and customs of the target language.
- d) *Engagement and Motivation*: Video content can be more engaging and motivating for learners, as it is visually stimulating and can relate to real-life situations. Watching movies or TV shows in the target language can stimulate interest and keep learners more committed to their language-learning journey.
- e) *Contextual Learning*: Videos offer opportunities for contextual learning, where learners can see language used in everyday situations, which is vital for practical language skills.
- f) *Vocabulary and Idiom Acquisition*: Learners can pick up new vocabulary and idiomatic expressions from watching and listening to videos.
- g) *Convenience*: Platforms can be accessed on various devices, allowing viewers to learn English at their own pace and schedule.

Among the disadvantages of video streaming as an aid for learning languages, we mention that streaming video works only when there is an available Internet connection; streaming videos require sufficient Internet speed to function correctly, as well as the cost of subscription and of devices which become more performant.

Some also refer to the most common mistake people make when learning English by watching: it can be delightful, but it is still a passive language learning activity, and therefore, it cannot and should not replace the active way of learning (Shayna Oliveira, 2023). A Harvard study (Ruder, 2019) analyzing the influence of devices on brain activity shows that the brain can be more active while sleeping than when watching TV; thus, simple exposure to audiovisual input like listening to podcasts or watching movies is unlikely to be sufficient in itself for language learning to occur. Another shortcoming of video streaming platforms as learning tool aids has to do with the proficiency level of the viewer, and it has been argued that an intermediate level is the necessary proficiency prerequisite to start benefiting from audiovisual input to the full extent (Danan, 2004).

Unlike language learning apps or classes with teachers, video platforms may not provide immediate feedback on your language skills. This can make it challenging to identify and correct mistakes, constituting another con for the topic.

4. Video streaming platforms. Netflix

In an era where video streaming platforms have gained significant prominence in our daily lives, it is imperative to consider their potential impact on education as specialists reveal that in the process of acquiring a foreign language, input plays an important part.

Adapting the teaching-learning process to the everchanging learners' interests is crucial and comparable to the importance of content marketing in ensuring customer engagement and commitment to a brand (Nurain & Harwati, 2019) transferred to the educational system.

Video streaming content is conveyed over various platforms, including social media platforms like YouTube Live, Facebook Live, Twitter, Instagram Live, and TikTok, as well as through professional business services, such as Kaltura and Dacast. It was not until the early 1990s that computers evolved into devices powerful enough to display streamed media. Music concerts and baseball games were among the first events to be streamed. The base for the first practical video coding format, the discrete cosine transform (DCT) algorithm, was developed for image and video compression. The first commercial video streaming product, StarWorks, was released in 1990. After several small but sure steps in the industry in 1999, Apple released a streaming media format called QuickTime. The same year, President Bill Clinton participated in a presidential webcast at George Washington University. The early 2000s also offered improved protocol formats for video streaming. According to Britannica, three years later, the streaming service Twitch began hosting livestreams of video games, which became immensely popular. In the following years, platforms such as YouTube, Twitter, Facebook, and Instagram introduced live streaming availability for users. In 2005, a new level was reached when YouTube was born, together with the latest opportunities offered. In 2008, YouTube hosted its first live event, called YouTube Live. Today, creators who have more than 1,000 subscribers on their channel can livestream on mobile devices. 2020, the Statista database predicted that the number of video-on-demand viewers in the U.S. will grow from 143.3 million in 2020 to 164.9 million by 2025.

There are several video streaming platforms with plenty of content for learning English, offering a wide range of videos, including educational content, language learning materials, and entertainment, all of which can help improve English language skills. Some popular video streaming platforms are Amazon Prime Video, Apple TV+, Disney+, HBO Max, Hulu, Netflix, Peacock, Twitch, YouTube, Skyshowtime, etc.

Netflix is a subscription video-on-demand streaming service that has become extremely popular and has been considered in the media as “a transformative tool for language learning” (Tapper, 2019). The platform offers original and acquired films, documentaries, and shows from various genres, and it is available internationally in 190 countries. Its subtitle options make videos, movies, and TV series accessible to language learners at all levels, providing both entertainment and exposure to foreign languages. In addition, David Wilkinson and Ognjen Apic are the tool’s developers, which began as a hobby project and turned into a Chrome browser extension called “Language Learning with Netflix (LLN).” The ambitious project has become an exciting tool that enables viewers to watch foreign language shows with subtitles both in the original language and English and pauses automatically to allow the learner/viewer to absorb what has just been heard. The significant number of people downloading the tool indicates that viewers are also looking to optimize their entertaining experience, which becomes an entertainment-based language learning activity.

Although there still seems to be a lack of extensive research on Netflix specifically, there are studies on language learning through immersion. Netflix can serve as a passive immersion, potentially contributing to language proficiency growth through its dual language subtitles, a popup dictionary, precise video playback controls, and many more features when watching films and series.

5. Specific strategies for using video streaming platforms in learning. Practice tasks

5.1. Features and Tips

Despite being a passive activity, Netflix holds potential, and this article investigates it for self-directed language learning within a formal educational context; examples and activities that can be used with students are also provided. Learning Languages with Netflix allows viewers to become involved with the language while watching Netflix content. Video content offers visual and auditory input, enhancing language comprehension and retention. It will enable seeing and hearing native speakers, crucial for improving pronunciation and understanding accents. In this respect, Netflix can be a valuable resource for learning English, provided viewers approach it with a language-learning mindset.

Features that help:

a) *watch with two subtitles*: Watching TV shows or movies with two subtitles - one in the original language and the other in your target language enables you to mirror and compare, and it helps pick up on the meaning of words. While subtitles can be helpful for comprehension, relying too heavily on them can hinder the ability to listen and understand spoken English without written assistance.

b) turn on English subtitles only: to assist with comprehension, turn on English subtitles. This way, you can read along with the dialogue while listening to it, reinforcing your understanding of spoken English. Unlike podcasts, which are also passive learning activities, viewers benefit from video to better understand a lot through context. Reading instead of listening and watching will be tempting but it is a start. The effort is to keep the eyes on the top of the screen, focus on watching, and only look down at the subtitles if something prevents understanding the core message. Reading the subtitles does not force the brain to listen; thus, the progress will be slow. Video streaming is great as viewers can also listen to subtitles one at a time or line by line, even hear it over, which makes it much easier for them to follow conversations and pause when they need more time to understand what is happening.

c) turn off the English subtitles/ all subtitles: provided that the audio is English, viewers who want to improve English language skills and acquire new vocabulary should turn off the subtitles once they feel they understand more than 80% of the action; it might make watching slightly less enjoyable at the beginning, but from a learning perspective, it will be much effective.

d) use the built-in dictionary available on LLN, as it provides easy access when seeing the translation or meaning of a specific word.

e) take benefit of the pro features (paid), which include an option to save phrases, enabling one to focus on them later, choosing auto-translation or human translation.

f) repeat and review: it might be an excellent tip to rewatch challenging episodes or scenes, as repetition can be a powerful learning tool.

g) take notes: while watching, taking notes of new words or phrases can help to improve the vocabulary; it may be successfully followed by looking up their meanings and creating flashcards or a vocabulary list.

5.2. Practice tasks for business purposes

Establishing specific language learning goals for Netflix usage is critical for success; for example, aiming to watch a certain number of episodes per week or understand a particular series without subtitles could help real progress. This progress can, for instance, be measured in improving specialized business vocabulary - a desirable goal when preparing to enter the labor market. Whether the personal goal is learning a certain number of new terms each week or mastering the language related to a particular aspect of an industry, setting goals can help stay focused and motivated. Improvement takes time, consequently, patience and consistency are essential. Integrating strategies into daily routines will contribute to a gradual and lasting enhancement of business vocabulary.

Among the classic strategies that enhance business vocabulary, we mention *reading* industry publications, business books, and reports that will expose the learner to the latest trends, developments, and terminology; *enrolling* in relevant courses or workshops that focus on business communication and vocabulary; *participating* in professional networking events, conferences, and seminars; *keeping* business dictionaries and glossaries handy; *watching* business documentaries and talks; *listening* to business podcasts that focus on the field of interest which help familiarize with business language. There is also Netflix with its business series, films or documentaries.

Teachers as facilitators may indicate different fields of interest and the movies/series that focus on them; diverse assignments and aspects are to be noticed while watching and then discussed in the class:

a) series or movies set in or revolve around a specific industry or business environment. For example, "Suits" for law firms, "Silicon Valley" for the tech industry, or "Mad Men" for the advertising world. Students are advised to pay attention to the terminology used by characters in those settings and to take note of industry-specific jargon, acronyms, and expressions.

b) students focus on professional interactions and are to observe how characters communicate in professional settings; they need to pay attention to how they structure their sentences, hold meetings, negotiate, and discuss business strategies. Analyzing the language used during presentations, interviews, and business meetings can help provide insights into effective communication in a professional context.

c) students have to identify characters who hold leadership or managerial positions, paying attention to leadership styles and the language they use to motivate, delegate, and manage teams; instances of conflict resolution and negotiation are spotted as these situations often showcase persuasive and diplomatic language.

d) exploring series or movies that depict international business scenarios can also be done with Netflix. These can expose students to various accents, communication styles, and cultural nuances in the business world; students note how characters navigate cross-cultural communication challenges and adapt their language to different contexts.

e) if the class aims to improve financial vocabulary, students may be guided to watch content involving finance and economics. At the same time, they document how characters discuss budgets, investments, market trends, and financial strategies.

f) numerous legal dramas or series with a legal focus can be beneficial for improving legal and contractual vocabulary, while attention should be given to how characters articulate legal concepts, negotiate contracts, and handle legal disputes.

g) project management and innovation are among the trendiest facets of business these days, so teachers may consider exploring series or movies that showcase project management or innovation in a business context; this can help understand the language associated with project planning, execution, and problem-solving.

h) customer relations and marketing are also very well represented in movies and series; thus, students may look for content that highlights customer relations, marketing strategies, and advertising and be exposed to the language related to branding, market research, and customer engagement.

Using subtitles or pausing and rewinding scenes to fully grasp the language used in specific contexts are strategies enabled by Netflix for learning. Additionally, teachers as facilitators complement learning with industry-specific readings and discussions to deepen the understanding of specialized business vocabulary.

6. Conclusions

This article aims to offer a tentative explanation of the effectiveness and efficiency of using video streaming platforms as learning aids and to shed some light on how much technology, more precisely video streaming platforms (Netflix in particular),

can assist and support English language acquisition. When teaching a foreign language, instructors as facilitators should focus on diverse means of arising interest and motivation as crucial ingredients of the instruction process. Netflix can be part of a broader language-learning strategy. Complemented with grammar exercises, vocabulary building, and real-life interactions, it is a valuable tool for learners. This paper's discussions and presentations will hopefully encourage further research and exploration in this promising field.

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CHATGPT - LEARNING ACCELERATOR OR DEMOLISHER OF FOREIGN LANGUAGE TEACHING AND LEARNING? AN EMPIRICAL STUDY ON BUSINESS FRENCH

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Abstract: *Few inventions are as provocative and genuinely frightening as ChatGPT. Launched in 2022, ChatGPT is sparking lively debate and raising ethical, academic and professional questions across the board. The impact of artificial intelligence on the teaching and learning of foreign languages, as well as its use in professional settings, will undoubtedly be considerable. It is still difficult for non-specialists to understand clearly the extent to which the conversational robot could become a real competitor in the job market and, in time, replace humans. This is why we are proposing a simple and illustrative model for simulating professional activity, built around the issue of foreign languages in the professional environment. This model highlights the undeniable contrast between the expenditure of time and energy by human intelligence and artificial intelligence, respectively, in solving the same professional task. This impactful strategic approach, through the cinematic effect of its presentation, is capable of provoking significant awareness and stimulating reflection on the role of AI in the learning process of students or employees and their integration into the future labour market. The case study on business correspondence in French can be extrapolated to other foreign languages and can serve as a pretext for similar studies or training courses in other fields. The machine is clearly superior to humans in its ability to generate numerous correct versions extremely quickly in the resolution of professional tasks. From the perspective of various stakeholders - teachers and students, employees and employers, educational policy designers, and official decision-makers - we will show that artificial intelligence will force everyone to reconsider previous approaches and make radical changes. Artificial intelligence can represent a real opportunity for users who want to accelerate their foreign language learning and improve their linguistic proficiency. The machine's performance can also pose a threat to language teaching and learning as traditionally known. ChatGPT is like a sharp knife, capable of doing both good and harm depending on how it is used.*

Keywords: *ChatGPT, Artificial Intelligence, AI, foreign languages with specific objectives, business correspondence*

JEL Classification: *D83, Z19.*

1. Introduction

Crises of all kinds – wars, pandemics, or ecological disasters – have transformed habits of personal and professional communication, making people more isolated, autonomous, and introspective. Visible trends, exemplified by terms such as "slowbalisation" (Kandil et al.) or "de-globalization," in contrast to the well-established concept of "globalization," indicate a profound shift. Learners are increasingly inclined towards quick problem-solving strategies, accelerated learning, and avoiding time-consuming solutions. This exposes them to risks of which they may not be aware, as long as they completely rely on and become dependent on technologies.

Today, tools like Google Translate, DeepL, or Reverso accompany not only those working in the communication field but also language non-specialists in both personal and professional contexts. However, the latest generation of AI devices is quite different because they are forms of conversational artificial intelligence, seemingly replacing many tasks previously performed by humans. The White Paper (2020: 10) also drew attention to its potential negative effects since "like any new technology, the use of AI creates both opportunities and risks." Nevertheless, it remains "a tool that could enable the transformation of education to meet the needs of the future" (Tuomim, 2020: 4).

2. Literature review

ChatGPT is ushering in a wave of changes, necessitating a reassessment of current practices (Nikolic et al., 2023). The ethical issue is particularly pressing, and educational establishments are being called on to create clear policies to mitigate the disruptive effects of artificial intelligence and preserve academic integrity (Adeshola & Adepoju, 2023). Attempts to detect its usage, whether by students (Netto, 2023) or by teachers, represent a sensitive issue. All research underscores the potential of artificial intelligence while asserting that it cannot replace human expertise and intelligence (Osama et al., 2023). On the other hand, teachers must guide students in evaluating generated responses (Shoufan, 2023).

In the field of education, researchers believe that ChatGPT is a promising solution (Su et al., 2023) and recommend its integration into courses rather than accepting unsupervised use by students (Daun and Brings, 2023). They also suggest the most effective ways to integrate it into the classroom (Pokkakillath & Suleri, 2023). There are already numerous studies on the impact of ChatGPT in various fields such as medicine, economics, tourism, marketing, software engineering, education, etc.

Authors express concerns regarding the creation of medical content (Zuckerman et al., 2023), ChatGPT's performance in medical exams (Sedaghat, 2023), the drafting of medical scientific articles (Benichou, 2023), the use of ChatGPT for online health information in Turkish (Yıldız & Alper, 2023), as well as the assistance provided to health researchers and scientists from countries that do not have English as a native language, to communicate their scientific results to the international community (Osama et al., 2023).

Zhou et al. (2023) analysed the relationship between ChatGPT and marketing, while the potential implications of ChatGPT in tourism and hospitality were explored by

Carvalho and Ivanov (2023). Daun and Brings' (2023) article highlights the potential for improving software engineering education, and the contribution of Ran and Xu (2023) proposes an effective alternative solution for mapping.

In 1992, Boucher questioned the then-trendy field of artificial intelligence: "Is it a significant evolution that can interest educators, especially language teachers?" (Boucher, 1992: 9). After 2022, the field of language education proved particularly interesting in its relationship with ChatGPT. Current research explores the possibilities of chatbots in language teaching and learning (Kohnke et al., 2023), methods of teaching and assessing second and foreign languages (Ghafar, 2023), or the potential assistance for students in learning English (Bin-Hady et al., 2023). The potential advantages and disadvantages of using ChatGPT in language education (Ulla et al., 2023), as well as the positive and negative aspects of its use in translation education (Sahari et al., 2023), are highly concerning topics. Chiu (2023) and Vaccino-Salvadore (2023) appreciate that ChatGPT has opened new opportunities for language learning while emphasizing important ethical considerations.

Our study aims to contribute to the debate on the impact of ChatGPT on the learning and teaching of foreign languages. In this article, we propose a practical and suggestive model designed to give students a clear understanding of the risks and opportunities associated with ChatGPT in their academic training and integration into the job market. Our example is also relevant for employees and employers who are not yet familiar or only slightly acquainted with this phenomenon, helping them better grasp the potential and impact. The contrast between the expenditure of human time and energy inherent in a traditional learning approach and the superhuman performance of an intelligent machine can provide stakeholders with a precise picture of the intervention of generative AI in economic activities. The case study on business correspondence in French can be extrapolated to other foreign languages and even to other disciplines, thus serving as a pretext for similar studies in various fields.

3. The impact of artificial intelligence on the field of education

Few inventions are as provocative and genuinely frightening as ChatGPT. This tool, eagerly awaited by experts, came as a surprise to many and continues to surprise AI non-specialists in all fields. The ChatGPT robot conceives, formulates, and instantly delivers excellent versions of new texts in almost any language chosen by the user or in translation from one language to another. Appearing in November 2022, this instrument has demonstrated an extraordinary proliferation force in all domains, as it is highly efficient, free, and easily accessible to everyone.

Very quickly after its appearance, before many took notice, this tool tested educational policymakers and official decision-makers. To better understand the shock generated by the arrival of this robot, we chose to illustrate with a contradictory and transitional experience in American education shortly after the launch of ChatGPT. Within a few months, national policies underwent a radical shift, transitioning from rejection, prohibition, and exclusion of a perceived negative,

disruptive, and threatening element (Elsen-Rooney, 202; Shen-Berro, 2023) to acceptance, adaptation, and adoption.

David C. Banks, the chancellor of the public schools of the City of New York, announced a change in attitude towards AI during a festive public meeting, emphasizing the need to guide students in interacting with AI and highlighting the necessity for a more proactive approach to the future of society and employment.

“After a cautious start, our approach to AI technology is evolving... We encourage all schools to engage students in activities exploring how artificial intelligence has already impacted their lives and the broader issues it presents to our society... We will also ensure our students are supported by AI’s opportunities and prepared for the jobs of today and the future. Any of those opportunities will be built on technological innovations — both AI and innovations we do not yet know (Banks, 2023).

ChatGPT raises important academic and professional questions in the field of education. Consequently, the impact of artificial intelligence in the field of language teaching and learning will undoubtedly be substantial. In this article, we will identify the risks and opportunities associated with the use of ChatGPT for languages with specific learning objectives. We propose an illustrative model that is clear enough for non-philology students who are still unaware of ChatGPT's strengths and capabilities, but who can quickly understand the following context. On the one hand, the robot helps them to produce predefined assignments for school assessments quickly and without much personal thought. On the other hand, this situation generates the real risk of replacing humans in the future job market, which is an extremely worrying prospect. Unwittingly, users are relying on an entity that will become a ruthless competitor with no right of appeal.

From the perspective of various stakeholders - teachers and students, employees and employers, educational policy designers, and official decision-makers - the artificial intelligence will force everyone to reconsider previous approaches and make radical changes.

4. Illustrative Model for the Human Intelligence vs. Artificial Intelligence Competition – Empirical Study on Foreign Languages

4.1. Didactic Strategy Based on the Contrast between Human Intelligence and Artificial Intelligence

Preliminaries: In March 2023, five months after the launch of ChatGPT, we addressed the issue of Artificial Intelligence with students. The attempt to initiate a discussion on this problematic topic encountered resistance, owing to the divergent reception of the phenomenon among students. We identified students who had never heard of AI or ChatGPT and students who had heard of it but had never tested it (obviously some of them had tested and used ChatGPT but did not admit it); at the same time, some students had tested and used ChatGPT and openly acknowledged it, though the admission was accompanied by smiles, hinting at a certain shame or guilt.

The warning discourse, cautioning about the danger of ChatGPT as a real competitor in the job market, did not seem to convince the students. Consequently, the teacher had to illustrate the situation with a concrete and evocative example.

Objective: The stated objective is to raise awareness among students about the impact of Artificial Intelligence technology on learning and the workplace. The teacher relies on the shock effect created by the contrast between, on one hand, the efforts and difficulties faced by human intelligence (at the individual and group levels) and, on the other hand, the extraordinary performance, speed, and efficiency achieved exclusively by artificial intelligence in managing an identical task. This powerful and impactful pedagogical strategy captures the attention and prompts reflection from students. It can also be utilized in training courses or introductory workshops on artificial intelligence.

Duration: 2 hours

Suggested Activity: This is a working group project, simulating a real work situation: writing a sales letter for a given product in a typical format, which had been previously introduced in another course. In our case, it involves the scenario where the director of a commercial company assigns the task to the team to write a short sales letter for a package of Isigny Caramels made available to them in a physical format (any other product or service can be used, following the same demonstrative paradigm). This provides students with an experience close to real professional scenarios, allowing them to focus on a defined task.

Target Audience: Group of students in economics (some of whom are already employed) with skills in foreign languages with business purposes. In our case, there are 10 final-year undergraduate students specializing in International Business and International Business in English, with an average proficiency level of A2-B1 in business French (their second studied foreign language).

Structure: The activity unfolds in two phases.

In the first phase (Step I), we worked with Human Intelligence for the design of the material in the native language (I.1) and the translation into French (I.2). In turn, the translation takes place in two ways: progressively with partial assistance from the machine (I.2.a), and entirely by the automatic translation engine (I.2.b).

In the second phase (Step II), the teacher entrusts the same task to Artificial Intelligence, without any intervention. The demonstration is all the more spectacular as it is projected on the wall, in front of the eyes of all participants.

Options: The task can be assigned to an individual, to groups of two or three people, or even to a larger group. In the latter case, it is likely that students taking the initiative will break into subgroups and work individually on their own versions. The working protocol remains unchanged.

Justification for the choice: The sales letter is, in business correspondence, the simplest, most flexible, and creative. In principle, it is the easiest to execute once its main sequences have been mastered (the theoretical elements and models were taught in a previous course).

4.2. Factors influencing stages I.1 and I.2 (priority to Human Intelligence)

I.1. Several factors can influence the success of an exercise of this type: scientific ignorance, lack of confidence in linguistic skills, discomfort related to teamwork, time constraints, reluctance to assume roles in the group, a deficit in motivation, emotional

factors, etc. To address these issues, an initial version of the letter in the native language has been requested.

The design of the native language version depends exclusively on the mastery of scientific information (such as the structure of the letter, vocabulary, and specific grammatical structures) and the synergy of the group.

The request to provide multiple different versions of the same document leads to a decrease in efficiency, even to effective blockages. In any case, the possibility of versions produced by human participants remains limited.

1.2.a. The transfer from the native language version to the foreign language (in this case, French) was carried out in a step-by-step approach, involving the search for each unknown word in machine translation engines such as DeepL or Google Translate, and the construction of verb forms using the Conjugator. It is a laborious process that requires more than an hour to achieve an acceptable version of the professional document. The teacher plays an active role and pursues objectives related to specialized vocabulary, grammatical structures, errors, oral and written communication, etc.

The task of writing a second version of the letter can have a dual effect: either the group mobilizes and generates a new letter, partially or completely different from the previous one, or it encounters blockages due to a lack of inspiration and creativity.

The teacher can ask students, similar to a business leader with their employees, to draft several (three, four, etc.) letters on the same theme to obtain multiple versions. When this task is also time-limited (20 or 30 minutes), the reaction is vocal, and the group reluctantly accepts the possibility of conceiving multiple letters in the native language and gradually translating them into a foreign language within short deadlines and without the assistance of a machine translator.

1.2.b. When the text in the native language is input into machine translation engines, the text is entirely generated in the chosen language. At this stage, there is no significant disruptive factor that could come into play: the engine translates a given text; it does not generate it. Most students are accustomed to this process, as it is the most commonly used method for translation.

4.3. Factors influencing stage II (priority to Artificial Intelligence)

The element of surprise emerges in this stage of the demonstrative strategy. After an activity conducted gradually towards the goal announced at the beginning of the session, users can independently observe the striking contrast between their investment of effort, time, and energy on one hand, and the robot's performance on the other.

Following the initial activity, the teacher makes way for Artificial Intelligence, initiating a demonstrative session with ChatGPT. The same task is delegated to the machine: "Write in Romanian a sales letter for the product Caramels d'Isigny." The teacher requests a new version, and so on. Students observe how the machine generates about ten sales letters on the given theme in their native language within a few minutes. These texts are correct in terms of vocabulary, grammar, and the typical structure of sales letters (Table 1).

ChatGPT generates a sales letter in the requester's native language every 20 seconds. Students watch as a letter is generated and unfolds cursively before their eyes as if produced by a typewriter at an expert pace.

Table 1. Selection of 3 sales letters in Romanian,
generated in less than a minute (Phase II.1)

Letter 1 in Romanian (20 seconds)	Letter 2 in Romanian (20 seconds)	Letter 3 in Romanian (20 seconds)
<p>Stimate client,</p> <p>Suntem încântați să vă prezentăm pastilele de Vichy - o alegere excelentă pentru sănătatea și bunăstarea dumneavoastră.</p> <p>Pastilele de Vichy sunt fabricate din ingrediente naturale, oferindu-vă o modalitate sigură și eficientă de a vă menține sănătatea orală. Formula unică a pastilelor noastre vă va ajuta să vă mențineți respirația proaspătă și să preveniți formarea plăcii bacteriene și a cariilor dentare.</p> <p>Pastilele de Vichy sunt disponibile în diferite arome, inclusiv mentă, eucalipt și portocală, astfel încât să puteți alege aroma preferată. Aceste pastile sunt perfecte pentru utilizare zilnică, acasă sau în mișcare, deoarece sunt ambalate în cutii mici și ușor de transportat.</p> <p>Produsele noastre sunt fabricate cu grijă în Franța, utilizând cele mai bune ingrediente disponibile și respectând cele mai riguroase standarde de calitate. Suntem mândri să putem oferi produse de înaltă calitate la prețuri accesibile, astfel încât să puteți să vă bucurați de beneficiile pastilelor de Vichy fără a cheltui o avere.</p> <p>În concluzie, pastilele de Vichy sunt o alegere excelentă pentru cei care își doresc o igienă orală excelentă și o respirație proaspătă. Suntem convinși că veți fi încântați de calitatea și gustul pastilelor</p>	<p>Stimate client,</p> <p>Suntem încântați să vă prezentăm pastilele de Vichy, un produs de înaltă calitate, care vă va oferi o respirație proaspătă și plăcută. Dacă sunteți în căutarea unui produs eficient și de încredere pentru a îmbunătăți igiena orală, atunci pastilele de Vichy sunt alegerea perfectă pentru dumneavoastră.</p> <p>Pastilele noastre sunt fabricate cu ingrediente de cea mai înaltă calitate, care au fost selectate cu grijă pentru a oferi cea mai bună experiență pentru dvs. Fiecare pastilă este îmbogățită cu ingrediente naturale și minerale esențiale, pentru a ajuta la menținerea sănătății și frumuseții dinților și gingiilor.</p> <p>Pastilele de Vichy sunt ideale pentru a fi folosite acasă, în timpul călătoriilor sau la birou. Acestea vin într-un ambalaj convenabil și ușor de transportat, astfel încât să puteți avea întotdeauna o pastilă la îndemână.</p> <p>În plus față de beneficiile pentru igiena orală, pastilele noastre sunt disponibile într-o varietate de arome delicioase, care vă vor ajuta să vă bucurați de o respirație proaspătă și plăcută pe tot parcursul zilei.</p> <p>Vă invităm să încercați pastilele de Vichy și suntem siguri că veți fi mulțumiți de calitatea produsului nostru. Nu mai stați pe gânduri și comandați acum, pentru a vă bucura de o respirație</p>	<p>Dragă client,</p> <p>Dacă sunteți în căutarea unui produs eficient și de încredere pentru a vă îmbunătăți igiena orală, atunci pastilele de Vichy sunt alegerea perfectă pentru dumneavoastră.</p> <p>Vă prezentăm pastilele noastre de înaltă calitate, care vă vor oferi o respirație proaspătă și plăcută în orice moment al zilei. Fabricate cu ingrediente de cea mai înaltă calitate, pastilele noastre conțin minerale esențiale și ingrediente naturale, pentru a vă ajuta să mențineți sănătatea și frumusețea dinților și gingiilor.</p> <p>De ce să alegeți pastilele de Vichy? Pentru că acestea sunt disponibile într-o varietate de arome delicioase, care vă vor ajuta să vă bucurați de o respirație proaspătă și plăcută în orice moment al zilei. Pastilele noastre vin într-un ambalaj convenabil și ușor de transportat, astfel încât să puteți avea întotdeauna o pastilă la îndemână.</p> <p>Și nu uitați, pastilele de Vichy nu sunt doar pentru igiena orală. Acestea sunt ideale și pentru a reduce senzația de gură uscată și pentru a vă ajuta să vă mențineți hidratarea. De asemenea, pastilele noastre sunt perfecte pentru a fi folosite în timpul călătoriilor, la birou sau acasă.</p> <p>Suntem convinși că veți fi mulțumiți de calitatea produsului nostru și vă invităm să încercați pastilele de Vichy astăzi. Nu mai așteptați și comandați acum pentru a vă bucura de o</p>

noastre și vă invităm să le încercați.	proaspătă și plăcută în orice moment al zilei!	respirație proaspătă și plăcută în orice moment al zilei!
Cu sinceritate, Echipa de vânzări Vichy.	Cu stimă, Echipa de vânzări Vichy.	Cu stimă, Echipa de vânzări Vichy.

The instruction is repeated, but this time changing the language: "Write in French a sales letter for the product Caramels d'Isigny". The teacher and students effectively disappear from this content generation process, which is designed by the robot directly in the chosen language. The effect is immediate and surprising. As in the first phase of the activity, based on native language, the teacher requests new versions one after another. Students observe how the machine generates about ten sales letters in a few minutes, without any human involvement. Both students and the teacher agree that all versions are correct and adhere to the typical style of a sales letter in French (Table 2).

Table 2. Selection of 3 sales letters in French,
generated in less than a minute (Phase II.2)

Letter 1 in French (20 seconds)	Letter 2 in French (20 seconds)	Letter 3 in French (20 seconds)
<p>Chère client(e),</p> <p>Si vous êtes à la recherche d'un produit efficace et fiable pour améliorer votre hygiène bucco-dentaire, alors les Pastilles de Vichy sont le choix parfait pour vous.</p> <p>Nos pastilles de haute qualité contiennent des ingrédients naturels soigneusement sélectionnés pour offrir la meilleure expérience possible à votre bouche. Chaque pastille contient des minéraux essentiels pour vous aider à maintenir une haleine fraîche et agréable tout au long de la journée.</p> <p>Mais ce n'est pas tout. Les Pastilles de Vichy sont également idéales pour réduire la sensation de bouche sèche et pour vous aider à rester hydraté(e), même pendant les journées les plus chargées. L'emballage pratique et facile à transporter rend nos pastilles parfaites pour être emportées avec vous partout où vous allez - à la maison, au</p>	<p>Cher(e) Amateur(trice) de Douceurs,</p> <p>Nous sommes ravis de vous présenter nos délicieux Caramels d'Isigny, une expérience gustative incomparable qui éveillera vos papilles et vous transportera dans le charmant village d'Isigny-sur-Mer, au cœur de la Normandie.</p> <p>Nos caramels sont confectionnés avec le plus grand soin, en utilisant la recette traditionnelle d'Isigny, réputée pour sa qualité exceptionnelle depuis des générations. Chaque bouchée offre une fusion parfaite de douceur crémeuse et de saveurs riches, créant une véritable symphonie de plaisir sucré.</p> <p>Pourquoi choisir nos Caramels d'Isigny?</p> <p>1. Qualité Artisanale: Fabriqués avec passion et savoir-faire, nos caramels sont le résultat d'un processus artisanal qui garantit une qualité inégalée.</p>	<p>Chère cliente,</p> <p>Si vous cherchez un produit efficace et fiable pour améliorer votre hygiène bucco-dentaire, alors les pastilles de Vichy sont le choix parfait pour vous.</p> <p>Nous sommes fiers de vous présenter nos pastilles de haute qualité, qui vous offriront une haleine fraîche et agréable à tout moment de la journée. Fabriquées avec des ingrédients de la plus haute qualité, nos pastilles contiennent des minéraux essentiels et des ingrédients naturels pour vous aider à maintenir la santé et la beauté de vos dents et de vos gencives.</p> <p>Pourquoi choisir les pastilles de Vichy? Parce qu'elles sont disponibles dans une variété de saveurs délicieuses qui vous aideront à profiter d'une haleine fraîche et agréable tout au long de la journée. Nos pastilles sont également disponibles dans un emballage pratique et facile à transporter, afin que vous puissiez toujours avoir une pastille à portée de main.</p>

Letter 1 in French (20 seconds)	Letter 2 in French (20 seconds)	Letter 3 in French (20 seconds)
<p>bureau ou pendant vos voyages.</p> <p>Pourquoi choisir les Pastilles de Vichy ? Parce qu'elles ne sont pas seulement efficaces, mais aussi disponibles dans une variété de saveurs délicieuses qui vous aideront à profiter d'une haleine fraîche et agréable tout au long de la journée. Avec nos pastilles, vous n'avez pas besoin de sacrifier votre goût préféré pour maintenir une hygiène bucco-dentaire optimale.</p> <p>Nous sommes convaincus que vous serez satisfait(e) de la qualité de notre produit et nous vous invitons à essayer les Pastilles de Vichy dès maintenant. Commandez dès aujourd'hui et profitez d'une haleine fraîche et agréable à tout moment de la journée !</p> <p>Cordialement, L'équipe de vente Vichy.</p>	<p>2. Ingrédients d'Excellence: Nous sélectionnons soigneusement des ingrédients de première qualité pour créer une expérience gustative authentique et mémorable.</p> <p>3. Tradition Normande: Plongez-vous dans la riche tradition normande avec chaque caramel, savourant l'héritage d'un terroir renommé.</p> <p>4. Emballage Élégant : Nos caramels sont emballés avec élégance, faisant d'eux le cadeau parfait pour vos proches ou une indulgence personnelle.</p> <p>Offrez-vous une pause gourmande avec nos Caramels d'Isigny, et laissez-vous transporter par la magie de la Normandie à chaque délicieuse bouchée.</p> <p>Commandez dès maintenant et découvrez pourquoi nos caramels sont une véritable célébration du bon goût et de la tradition.</p> <p>Bien sucrément,</p> <p>[Votre Nom] [Votre Entreprise] [Coordonnées de Contact]</p>	<p>Et n'oubliez pas, les pastilles de Vichy ne sont pas seulement pour l'hygiène bucco-dentaire. Elles sont également idéales pour réduire la sensation de bouche sèche et vous aider à maintenir votre hydratation. De plus, nos pastilles sont parfaites pour être utilisées pendant les voyages, au bureau ou à la maison.</p> <p>Nous sommes convaincus que vous serez satisfait(e) de la qualité de notre produit et nous vous invitons à essayer nos pastilles de Vichy dès aujourd'hui. N'attendez plus et commandez maintenant pour profiter d'une haleine fraîche et agréable à tout moment de la journée !</p> <p>Cordialement, L'équipe de vente de Vichy.</p>

5. Results and Discussions

The contrast between the expenditure of human time and energy in the first step and the minimal intervention in the second step gives students a clear idea of what the intervention of generative AI entails in solving a problem or specific task in the economic context. The almost cinematic effect guaranteed by the ChatGPT interface can have a double impact on the subjects: either they only see the immediate benefit of a tool capable of correctly and quickly solving specific tasks, developing ideas, providing suggestions, and making accurate translations, or they suddenly become aware of the danger that AI represents for their future.

The moment of phase II of the activity centred on the team project can be an excellent resource for the teacher's activity. The teachers are confronted with a series of texts which can be used from a didactic point of view. They can create their own grammar, vocabulary, and communication exercises, or request them from the machine. Despite the interest in the subject, we do not develop here the theme of the potential of ChatGPT for language teaching. The role of the teacher or a

professional in the field is important because, without expertise, most students cannot assess the level of correction of the generated texts. Additionally, from the perspective of academic assessment, it should be taken into consideration that the AI often generates versions with identical or very similar paragraphs, which can be detected by the teacher when checking homework.

In summary, the model revealing the opposition between human intelligence and artificial intelligence is represented in Table 3.

Table 3. Author's proposal for a Model revealing
the opposition between human intelligence and artificial intelligence

Steps		This activity
I. Human Intelligence (1h30 min)	I. 1. Designing a text on a given theme, in the mother tongue	<ul style="list-style-type: none"> Assumes teamwork skills on a group project
	I.2.a. Progressive translation of this text into a foreign language, done "manually," in the following context: <ul style="list-style-type: none"> Individual language skills Accepted tools: automatic translation engines (e.g., Google Translate or DeepL) and online dictionaries and conjugators (e.g., larousse.fr) Strict instruction: prohibition from asking the machine to translate phrases longer than 2 lexical units. 	<ul style="list-style-type: none"> Involves all the individual blocks and emotions of group members Assumes mastery of strategies specific to teamwork Requires a significant amount of time Increases the time invested
	I.2.b. Translation of a pre-existing text in the mother tongue by a form of artificial intelligence such as automatic translators (e.g., Google Translate or DeepL)	<ul style="list-style-type: none"> Cannot be carried out in the absence of step I.1 (preliminary work of drafting a text in the native language, on a given theme) Requires very little time
II. Artificial Intelligence (2- 3 minutes)	II. ChatGPT's Involvement in Task Resolution Content generations: several versions are generated before the students' eyes, who see numerous texts appear in real-time, all of which are absolutely correct. II.1. In their native language II.2. In the chosen foreign language	<ul style="list-style-type: none"> Does not require the design of the text in the native language. Requires very few time. Solves the task correctly. Solves a task repetitively, generating an unlimited number of different, correct, and competitive versions.

The discussion around this illustrative model of the impact of ChatGPT on the teaching/learning of foreign languages for current and future employees can be approached from several points of view:

Teachers may consider ChatGPT as an aid in designing teaching materials adapted to authentic professional situations or as a challenge for the evaluation of student assessments.

Students have the choice to use it either as a tool used dishonestly for school exams or as a facilitating instrument for their honest information and documentation. This model can provide them with a clear vision of the superhuman competition they will face in the future, radically changing the workplace as we have known it so far. At the time of hiring, they will necessarily have to demonstrate the ability to master AI, at a professional level.

Employers may perceive ChatGPT as an opportunity to minimize labour costs and optimize their economic activity, regardless of the sector.

Employees must adapt to the changes that will occur in the job market. They will need to improve themselves to master machines or consider retraining.

At the national and international levels, official decision-makers, institutions, organizations, or governments must agree on a legislative framework that takes into account all implications, especially in terms of ethics, control, or financing.

6. Conclusions

The model we have designed is based on a key element: the contrast between the capabilities of human intelligence and the potential of AI to solve the same professional task. Highlighting, through an accessible and cinematic illustrative model, the superhuman abilities of ChatGPT to manage professional tasks previously carried out by human intelligence is simply an attempt to provoke a shock effect. This emotional impact is triggering a major awareness of the implications of the use of AI in the training of students and in their future career paths.

Students now reluctantly acknowledge that they use ChatGPT, often because the way they use it is not the most ethical, i.e. they no longer invest themselves in solving assignments and ask the machine to provide them with ready-made versions (the same situation is possible in the professional sector, with work-related tasks). When the user instantly receives the solution and the worked-out answer, it is human nature to be satisfied with ready-made versions and save personal effort. But by surrendering to intelligent machines, students and professionals give up their right and obligation to develop their cognitive and emotional capacities. And yet, in the future, they will have an advantage in mastering AI, just like the other skills on the European CV.

The future belongs to artificial intelligence, which will play an increasingly important role in their daily and professional lives and will become a real and frightening competitor.

Our study concludes that artificial intelligence is like a sharp knife, capable of doing good or harm depending on how it is used. One thing is certain: there is a clear need for specific training in handling artificial intelligence, tailored to students - but also to teachers and professionals in all fields - so that they acquire the ability to manage artificial intelligence and avoid becoming an extension of it.

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ENJEUX ENVIRONNEMENTAUX ET INNOVATION LEXICALE. LE DOMAINE DE LA MOBILITÉ (ENVIRONMENTAL ISSUES AND LEXICAL INNOVATION. THE MOBILITY FIELD)

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Abstract: *One of the major issues of today is the climate emergency. The European Union's goals to reduce greenhouse gas emissions by 2050 and become climate neutral affect most areas of the economy, especially transport, where critical transformations are needed to meet current demands. Vehicle manufacturing has always been a dynamic sector that has constantly seen significant developments and innovations. In the desire to find and use new sources of energy, in recent years, vehicle manufacturers have proposed hybrid and electric models. Nevertheless, during the years of the Covid 19 pandemic, they recorded massive losses, people's transport habits undergoing very large changes. The transition to an electric fleet, the use of bicycles and electric scooters, as well as changes in everyday life have caused the entry into the common language of some technical terms and the creation of new lexical units. In this paper we aim to identify the neologisms that appeared in the field of sustainable mobility, based on the consultation of a corpus of written press, websites of automobile manufacturers and blogs. We will analyze the presence of official neologisms in journalistic texts, the procedures by which they are formed, the weight of terms with denotative value and those with connotative value, direct borrowings and loan translations, multiple translations of some neologisms from other languages.*

Keywords: *creativity, borrowing, environment, lexical innovation, mobility, neology, written press, responsibility*

JEL classification: Z19

1. Introduction

Le secteur automobile est l'un des marchés porteurs de l'économie, où la forte demande de produits et services va de pair avec l'offre toujours croissante de produits et services extrêmement diversifiés. Dans ce secteur, la recherche et le développement doivent suivre le rythme d'un monde en évolution rapide, tenir compte des technologies révolutionnaires, mais aussi des exigences de responsabilité environnementale et sociale.

Certes, l'innovation est importante dans tous les secteurs de l'économie, entre lesquels il y a de fortes interconnexions. Les changements technologiques rapides des dernières décennies ont eu une influence considérable sur l'ensemble de l'économie. Mais dans le domaine des transports, notamment dans l'industrie automobile, les transformations sont survenues à un rythme exponentiel, ce qui a

rapidement influencé aussi bien la vie quotidienne que les politiques gouvernementales.

Étant donné la nécessité de protéger l'environnement, la société essaie de renoncer graduellement aux véhicules thermiques. Ainsi, tous les constructeurs automobiles ont proposé ces dernières années des gammes de véhicules hybrides ou de véhicules 100% électriques. Ces produits ont eu un succès immédiat au public, en bénéficiant en général d'une image positive, malgré leurs prix élevés. Ils présentent de nombreux avantages : bas coût de recharge, dépenses d'entretien réduites, impact fiscal réduit (moins d'émissions polluantes), une prime à l'achat. En adoptant ces types de véhicules, la population a dû se familiariser avec des notions relatives à la recharge (à domicile – *la Wallbox* / sur les bornes publiques), aux types de prises (type 1, type 2, type 3 ou 3C, type 4 – CHAdeMO, Combo CCS).

Malgré les nombreux avantages de ces véhicules, la gestion de l'autonomie est parfois difficile, étant donné l'infrastructure encore peu développée. On parle ainsi de *range anxiety* (angoisse de la panne, anxiété de l'autonomie), à savoir la crainte de ne pas arriver à destination à cause de l'autonomie limitée des véhicules électriques.

Une partie importante des termes créés pour dénommer les nouveaux objets et les nouvelles notions passent de la langue de spécialité dans le vocabulaire général, entrant par la suite dans les dictionnaires. D'autres néologismes ne réussissent pas à s'intégrer dans la langue, ayant plutôt une fonction expressive. On peut donner l'exemple du mot « climathypocrite », utilisé par Marine Le Pen pendant la campagne présidentielle. On peut ainsi distinguer entre les hapax, « qui se limiteront au discours », et « les formes socialement diffusées », utilisées par les locuteurs et introduites dans les dictionnaires. (Boulanger, 2003 : 469) Il faut tout de même signaler que parfois, certaines créations à valeur stylistique, employées surtout dans le discours politique, sont reproduites par les médias. La responsabilité du néologisme est « co-partagée » entre le créateur et le journaliste et la frontière entre l'hapax et les néologismes « utiles » reste floue. (Sablayrolles 2002).

2. La néologie

Dans un article consacré à l'identification des traces d'innovation dans des textes spécialisés, sur la base de quatre indices linguistiques, Picton (2009) affirme qu'en général, « l'innovation dans les domaines de spécialité est essentiellement associée à l'apparition de néologismes ». Des mots nouveaux entrent constamment dans le lexique, certains sont utilisés pendant une certaine période de temps, d'autres sont repris par les dictionnaires.

Dans les années 1970, Guilbert faisait publier une série d'études portant sur la néologie et affirmait que l'évolution de la technologie menait naturellement à la création de nouveaux mots. Il s'agit de la néologie que Guilbert appelle dénomminative, « la chose diffusée [...] emporte avec elle son nom, même disgracieux, même étranger ». (1973 : 25) « L'objet fabriqué fait son entrée dans la langue dès l'instant qu'il existe ou même dès que l'inventeur ou le promoteur en conçoit l'existence ». (1973 : 24) Ce sont des créations lexicales nécessaires pour « faire face à l'évolution du monde contemporain, à la dénomination de toutes les inventions scientifiques et techniques ». (1973 : 25) D'autre part, pour des exigences

d'expressivité, le locuteur peut transposer ses pensées en créant de nouvelles unités lexicales. On parle de néologie connotative.

Guilbert considère que la néologie relève de la création linguistique, définie comme « l'acte d'expression d'une pensée individuelle, mais en fonction de la communication. Si un inventeur donne un nom à un objet façonné, à une technique de fabrication, à un nouveau concept élaboré, c'est pour le faire connaître aux autres membres de la communauté linguistique ». (1973 :13) Ainsi, le locuteur et l'interlocuteur sont tous les deux impliqués dans l'acte de création, c'est pourquoi la formation de néologismes est à la fois un acte de parole et un phénomène de langue. Nous adhérons à la conception de Guilbert, qui remarque le caractère collectif de toute création individuelle, étant donné que celle-ci « doit répondre à une certaine appétence de la collectivité linguistique pour prendre naissance et s'implanter. » (1973 : 14)

Alors qu'au XVIII^e siècle le néologisme avait une connotation négative (Sablayrolles, 2002), « le mécanisme néologique est la preuve de la vitalité d'une langue et de sa créativité, et constitue une propriété essentielle des langues vivantes ». (Cartier et alii 2018)

Au fil des années, beaucoup de chercheurs ont étudié la question de la néologie, en essayant de définir le concept de néologisme (Guilbert 1973, Pruvost, Sablayrolles 2003, de trouver des « indices » de nouveauté (Pincton 2009), de recenser et de dresser des typologies (Guilbert 1973, Sablayrolles 2002), de distinguer des sous-classes (néologismes / néonymes) (Dincă 2008), d'identifier les fonctions des néologismes (Sablayrolles 2000, Pruvost, Sablayrolles 2003), de s'interroger sur leur durée de vie (Sablayrolles 2000), d'analyser le traitement des termes nouveaux dans les dictionnaires (Gérard et alii 2017), d'examiner les difficultés d'une collecte « juste et exhaustive » des néologismes (Sablayrolles 2002), de proposer des plateformes pour la détection et le repérage automatique des néologismes (Cartier et alii 2018), d'analyser les emprunts (Soubrier 2016), de proposer des termes équivalents ou d'identifier les problèmes de traduction (Sardin 2012).

3. Corpus et méthodologie

Nous nous proposons d'identifier les néologismes créés dans le domaine de la mobilité durable suite au développement de ce secteur, en consultant un corpus de presse écrite, à savoir des articles extraits de la section *Économie* du quotidien d'information générale *Le Monde*, un journal de référence, une « fabrique de mots » (Robert Solé), du quotidien d'information générale *Le Figaro*, des quotidiens économiques *Les Échos* et *La Tribune* et des magazines *Le Point* et *Stratégies*. Nous avons opté pour un corpus de presse écrite en considérant, comme P. Albert, que la presse reflète les événements de l'actualité : « elle est sensible à toutes les évolutions politiques et économiques de la conjoncture comme à toutes les variations de la mode et de l'esprit du temps ». (Albert, 2004 : 7) La presse écrite et la presse audio-visuelle ont un rôle important dans la création et la diffusion des nouveaux mots, car elles sont « le lieu privilégié du débat ». (Pruvost, Sablayrolles 2003) D'ailleurs, de nombreux exemples repris par les dictionnaires proviennent de la presse écrite.

Nous avons consulté également quelques sites des constructeurs automobiles, où l'on peut trouver des glossaires conçus dans le but d'aider les potentiels clients à comprendre les nouvelles notions et le fonctionnement des nouveaux modèles de voitures et à prendre la décision d'achat.

Nous allons étudier la présence des néologismes « officiels » dans les textes journalistiques, l'importance des termes à valeur dénotative, la présence ou l'absence des nouveaux termes dans les dictionnaires (*Larousse, Dictionnaire de l'Académie*), le poids des emprunts à l'anglais, les traductions multiples de certains néologismes provenant d'autres langues.

La commission d'enrichissement de la langue française, une structure interministérielle qui fixe les désignations des nouveaux concepts et des nouvelles notions en français, fait publier tous les ans des listes de nouveaux termes de divers secteurs. Elle fournit « un vocabulaire français adapté aux besoins d'une communication claire et accessible au plus grand nombre », facilite l'accès aux notions de la science et de la technique, en menant une politique linguistique « qui vise à garantir l'emploi du français dans les diverses circonstances de la vie citoyenne ». (2022 : 5) Alors que beaucoup de termes anglais désignant des inventions sont repris tels quels dans de nombreuses langues, ce dispositif d'enrichissement de la langue française essaie d'identifier les nouveaux termes, de les définir et d'établir pour chacun d'eux des équivalents français. Ces termes entreront par la suite dans les dictionnaires.

Dans la liste dédiée au vocabulaire de l'aménagement, de l'habitat et de la mobilité recommandé pour l'année 2021, on trouve sept termes concernant la mobilité, avec leurs définitions et leurs équivalents étrangers (*électromobilité, gyroplanche, gyroroue, micromobilité urbaine, sas pour vélos, vélo-cargo, vélo-école*). Nous allons montrer que les journalistes accordent beaucoup d'espace au thème de la mobilité durable, que les nouvelles lexies, y compris les néologismes « officiels », sont très utilisées par les journalistes et mises en évidence dans les titres ou les sous-titres des articles.

4. Néologismes et mobilité durable

Le domaine des transports et de la mobilité a fourni beaucoup de mots qui sont entrés dans le vocabulaire général et que, de nos jours, on ne perçoit plus comme étant des néologismes. Pruvost et Sablayrolles (2003 : 33) donnaient comme exemples les mots : *montgolfière* (1782), *deux-roues* (1960), *aéroglisser* (1964), *rollerskate* (1985).

Un autre terme très employé, qu'aujourd'hui on ne perçoit plus comme un mot nouveau, est *covoiturage* (dérivé de *voiturage*, avec le préfixe *co-*), créé pendant les grèves de 1995. Il a été rapidement adopté par le public et il est entré dans les dictionnaires. On a forgé également le verbe *covoiturer* (faire du covoiturage, transporter par covoiturage).

Le thème de la mobilité durable a engendré des modifications dans les modes de déplacement des gens. On a proposé de supprimer les vols intérieurs qui peuvent être remplacés par un trajet alternatif de moins de 2h30, on a réduit le nombre des déplacements, on a essayé de faire des économies en matière de carburants, on a

privilegié l'utilisation du vélo. Par conséquent, le public s'est familiarisé avec des termes comme *mobilité partagée* (l'accès en libre-service aux infrastructures et services de transport), *mobilité active* (basée sur l'activité physique humaine), *mobilité propre* (l'ensemble des modes de transport peu polluants), *intermodalité* (l'utilisation d'au moins deux modes de transport sur un même déplacement), *multimodalité* (l'utilisation de transports différents pour un même trajet), *comodalité* (terme créé en 2006 par la Commission européenne, désignant le « recours efficace à différents modes de transport isolément ou en combinaison », en vue d'une utilisation durable des ressources). Ces mots sont très utilisés, mais ils ne sont pas encore répertoriés par les dictionnaires.

Nous parlons de plus en plus de *mobilité électrique* ou d'*électromobilité*, terme recommandé en 2021 par la commission d'enrichissement de la langue française, ayant comme équivalents anglais *electro mobility*, *electromobility*, *e-mobility*. La définition donnée par la commission est : « recours à des modes de transport de personnes ou de marchandises utilisant des véhicules mus exclusivement ou partiellement par une source d'énergie électrique ». (2002 : 143) On dit que l'avenir de la mobilité est électrique. Les deux synonymes sont très fréquents dans les articles de presse :

(titre) Chez Volkswagen, des voitures électriques à moins de 25 000 euros, et même à moins de 20 000 euros

(sous-titre) Le groupe automobile a présenté à Hambourg l'ID2all, qui sera l'un des véhicules électriques les plus abordables d'Europe, et compte aller plus loin en matière d'accès à l'électromobilité. (Le Monde, 15/03/2023)

« [...] le patron de PSA juge que l'avènement de l'électromobilité pourrait signer la fin de la puissance automobile européenne au profit d'une puissance chinoise qui a d'ores et déjà acquis une position de force. » (La Tribune, 13/09/2017).

(titre) Loi Climat et résilience : « Il sera crucial de s'engager dans la mobilité électrique pour le secteur automobile européen et pour les ménages modestes » (Le Monde, 01/04/2021)

Le néologisme *micromobilité urbaine* (dérivé de *mobilité*, avec le préfixe *micro-* + adjectif) se trouve lui aussi sur la liste des termes recommandés en 2021 par la commission d'enrichissement de la langue française. La définition donnée par la commission est : « recours à des engins légers de déplacement personnel pour effectuer de courts trajets en ville ». (2022 : 144)

(titre) Trotinette électrique, monoroue... La « micromobilité » urbaine en vogue

(sous-titre) Le marché de la mobilité urbaine se tient du 7 au 10 octobre au Salon Autonomy à Paris. (Le Monde, 06/10/2016)

« La micromobilité ouvre la voie à l'avenir du transport urbain Post-Covid. 2021 a été une année remarquable pour la micromobilité. [...] Chez PBSC Solutions Urbaines, nous croyons que la micromobilité partagée est le futur des transports urbains durables. » (pbsc.com)

D'autres néologismes recommandés sur la liste de 2021 sont *gyroplanche* (syn. *planche gyroscopique* ; équivalents étrangers : *gyroboard*, *hoverboard*), dérivé de *planche*, avec le suffixe *gyro-*, *gyroroue* (syn. *monoroue* ; équivalents étrangers : *gyrowheel*, *solo wheel*), dérivé de *roue*, avec le suffixe *gyro-*. Ils désignent des engins légers de déplacement personnel à moteur électrique.

« Sur le grand marché de la mobilité urbaine, qui sera célébré du 7 au 10 octobre au Salon Autonomy qui se tient à la Villette, à Paris, l'un des secteurs les plus dynamiques est celui des objets de « micromobilité » urbaine. Après l'essor du vélo à assistance électrique, qui s'écoule désormais à 100 000 exemplaires par an en France, les trottinettes, les monoroues gyropodes, mais aussi les draisienues, les planches à rouler électriques et autres « smartboard » (où l'on tient en équilibre sur deux roues) sont en train de coloniser trottoirs et pistes cyclables. » (Le Monde, 06/10/2016)

La commission d'enrichissement de la langue française mentionne également les notions suivantes (2022 : 144) : *sas pour vélos / pour cyclistes* (à savoir « la zone réservée aux cyclistes à un carrefour à feux tricolores, qui est marquée au sol devant la ligne d'arrêt des véhicules motorisés »), *vélo-école* (« structure d'enseignement où l'on apprend à circuler à vélo sur la voie publique en respectant le code de la route et à connaître les principaux risques associés à cette pratique ». Ces mots composés sont des créations françaises, qui n'ont pas de correspondant dans d'autres langues étrangères. Le dernier terme recommandé, dont les équivalents anglais sont *cargo bike*, *longtail cargo bike*, est *vélo-cargo* (« cycle à deux ou trois roues, dont le châssis est conçu pour recevoir une caisse ou une plateforme permettant le transport de charges, voire d'enfants ».)

(titre) Gyroroue, vélo-cargo, électrotrottinette... les tribus de la nouvelle mobilité urbaine

(sous-titre) A deux roues ou une seule, électrifiés ou pas, les objets roulants plus ou moins identifiés ont envahi la ville. Le profane s'y perd un peu et les adeptes ne cohabitent pas toujours en harmonie. Cartographie de transports peu communs. (Le Monde, 05/02/2021)

On parle de plus en plus de *vélogistique* (mot-valise construit à partir de *vélo* et de *logistique*), de *food bike* (emprunt direct) ou vélo de cuisine / vélo alimentaire / vélo gastronomique :

(titre) Le vélo-cargo, petite reine des pros

(sous-titre) Artisans, commerçants, livreurs sont de plus en plus nombreux à enfourcher leur vélo de travail. Le temps est venu de la « vélogistique », du « cycloplombier » et du « food bike ». (Le Monde, 18/10/2020)

Autour du concept de mobilité, on a également forgé des noms propres. Nous donnons l'exemple du mot-valise *Mobee* [troncation de *mo(bilité)* + *bee* (*abeille* en anglais – symbolisant la communauté)], désignant un service d'autopartage 100% électrique :

« L'agence Nomen a imaginé le nom du futur service monégasque d'autopartage de véhicules électriques, Mobee, pour le groupe EDF et la principauté de Monaco. Ce néologisme a été construit autour de la notion de mobilité, associant des références au « moi utilisateur » et au dynamisme de l'abeille (« bee » en anglais). » (Stratégies, 06/12/2013)

Dans le contexte de la crise sanitaire de 2020, de la baisse des déplacements pendant les périodes de confinement et du recours massif au télétravail, la presse a repris un néologisme forgé dans les années 2000 : *démobilité* (dérivé de *mobilité*, avec le préfixe *dé*). Ainsi, un magazine en ligne titre :

« Le monde post-Covid sera celui de la *démobilité* »

en expliquant le terme dans le sous-titre de l'article :

« Néologisme pré-pandémie, il désigne la limitation choisie des déplacements afin de ne plus subir inconfort et pertes de temps. La *démobilité* s'incarne dans le télétravail et constitue une perspective bien enclenchée qu'il faut savoir accompagner. » (Slate.fr)

Dans un entretien avec le sociologue Bruno Marzloff, celui-ci explique ce terme à valeur connotative en parlant de la mobilité actuelle et future :

« Avec le confinement, nous sommes dans l'immobilité, assignés à résidence. La "démobilité", c'est une mobilité choisie et frugale. La marche et le vélo en font partie. » (Cognasse 2020)

Grâce aux économies d'énergie et à la diminution des embouteillages que suppose la *démobilité*, cette notion fait référence à d'importants enjeux environnementaux :

« La croissance contemporaine des mobilités se conçoit alternativement comme extension des opportunités ou comme puissante menace environnementale. Prendre la route, le train ou l'avion incarne à la fois du plaisir personnel et de la destruction collective. La perspective de la « *démobilité* » – un néologisme qui date des années 2000 – cherche à dépasser cette tension, sans verser dans une décroissance obligée. » (Le Point, 02/12/2021)

Ce terme ne figure pas dans les dictionnaires consultés.

Une des mesures prises lors de la crise liée à la Covid-19 a été la nécessité de circuler seul dans son automobile. On a recommencé à parler d'*autosolisme* (dérivé de *autosoliste*, avec le suffixe *-isme* par substitution de suffixe), un néologisme créé au début des années 2000, mais qui à l'époque avait une connotation négative ; le mot est absent du Larousse et du Dictionnaire de l'Académie, mais il est répertorié par le dictionnaire de lalanguefrancaise.com.

« [...] en zones rurales [...] l'autosolisme reste encore trop souvent la norme. » (Les Échos, 02/06/2021)

(titre) « L'« autosolisme », ce phénomène catastrophique pour le climat qui ne cesse de progresser, selon Vinci » (La Tribune, 20/09/2022)

(titre) «Autosolisme» : plus de 85% des automobilistes roulent seuls dans leur voiture, selon Vinci (Le Figaro, 20/09/2022)

La voiture est un objet qui évolue, bien que sa fonction reste identique. L'industrie automobile est en train de se réinventer, vu les exigences environnementales, l'essor de l'industrie de l'électricité et les facilités apportées par le développement de l'informatique. Les pages *Économie* des quotidiens d'informations générales, les quotidiens et les magazines économiques consacrent beaucoup d'articles aux voitures hybrides et aux voitures électriques.

Il y a plusieurs termes nouveaux : *voiture électrifiée*, *voiture électrique*, *voiture hybride* (mots composés), *watture* (mot-valise, contraction de *watt* et de *voiture*). Même si ce dernier a été le lauréat de l'année 2012 au festival XYZ du mot et du son nouveau, le synonyme *voiture électrique* est plus utilisé dans le corpus.

Dans le titre d'un article du *Monde*, le néologisme *watture* est mis entre guillemets. Dans le sous-titre on parle de la catégorie des *voitures électrifiées* et le début de l'article précise les types de véhicules qui en font partie :

(titre) La « watture » lancée à grande vitesse

(sous-titre) Dopés par l'échéance de 2035, qui marquera la fin de la vente de véhicules thermiques, les constructeurs accélèrent la cadence sur le segment des voitures électrifiées.

« Le basculement dans l'ère de l'électrique n'est plus une échéance mais une réalité tangible. Au mois d'août, 40 % des véhicules neufs présentés à la vente étaient des modèles « électrifiés », une catégorie qui se répartit entre micro-hybrides et hybrides classiques (19,3 % du marché), hybrides rechargeables (8,5 %) et tout électriques (11,3 %). » (Le Monde, 21/09/2021)

Il y a trois grandes catégories de véhicules qui utilisent l'électricité : les véhicules électriques à batterie (BEV), les véhicules électriques hybrides (HEV) et les véhicules électriques à pile à combustible (FCEV) fonctionnant à l'hydrogène.

(titre) Les Chinois ne roulent plus à contresens

(sous-titre) Des "crossovers" aux véhicules hybrides, le Salon de Shanghai confirme que les goûts des conducteurs locaux se rapprochent de ceux du reste du monde.

« [...] Porsche a choisi à dessein le Salon de Shanghai pour lancer la version *E-Hybrid (hybride rechargeable)* de la Panamera, premier modèle de très haut de gamme capable de fonctionner en mode tout-électrique sur une trentaine de kilomètres. » (Le Monde, 25/04/2013)

Le conducteur d'un véhicule électrique est un *électromobiliste* (néologisme composé de *électromobile* avec le suffixe *-iste*). Les termes *électromobile* et *électromobiliste* ne figurent pas dans le Dictionnaire de l'Académie, ni dans le dictionnaire Larousse.

« Il faut interpeller les pouvoirs publics mais aussi les compagnies pétrolières. Toutes n'ont pas encore basculé avec la même conviction dans l'après-pompe à essence alors que le modèle économique des stations-service, voire des grandes surfaces, aurait tout à gagner de l'arrivée d'« électromobilistes ». Des clients immobilisés plusieurs dizaines de minutes pour recharger leurs véhicules représentent une manne pour les services associés, qu'il s'agisse de restauration ou d'autres prestations. » (Le Monde, 21/09/2021)

Les sites des constructeurs automobiles, aussi bien que les articles de presse, fournissent des définitions et des explications des notions relatives à la recharge et aux accessoires des véhicules électriques. Ils offrent également aux internautes ou aux lecteurs des mini-glossaires ou de petits lexiques de l'électricité ou de l'électromobilité, utiles pour l'achat et l'utilisation d'une voiture électrique. Nous pouvons les considérer comme des indices d'innovation. La plupart des lexies figurant dans ces glossaires sont des termes de spécialité qui, à un moment donné, entreront dans le vocabulaire général :

- l'acronyme IRVE (Infrastructures de recharge pour les véhicules électriques) ;
- la *Wallbox* (anglicisme), *coffret mural* ou *boîte murale* (une borne de recharge fixée au mur, qui supporte 16 ampères, dotée d'un dispositif de protection intégré) ;
- les bornes publiques ;
- point de recharge rapide (équivalent anglais : *fast-charging point*) ;
- *biberonnage* (un mode de recharge et un comportement type de l'utilisateur : une succession de recharges partielles d'accumulateurs, lors de chaque arrêt ; équivalent anglais : *opportunity charging*) ; le terme est admis au Larousse ;
- *Superchargeurs* : réseau fondé par Tesla pour assurer la recharge à forte puissance des véhicules ;
- *Plug-in* : dérivé du sigle anglais PHEV (*plug-in hybrid electric vehicle*) ; il s'agit des modèles hybrides-rechargeables que l'on branche sur une source d'électricité extérieure ;
- les types de prises (type 1, type 2, type 3 ou 3C, type 4 rapide – CHAdeMO, Combo ou CCS) ;
- le Smart Grid (réseau électrique intelligent) ;
- le Vehicle to Grid (V2G ou « du véhicule vers le réseau ») : une technologie permettant de « réinjecter l'électricité contenue dans les batteries d'une voiture électrique dans le réseau électrique durant les périodes de stationnement » (renaultgroup.com) ;
- le *passport batterie* (un document virtuel, obligatoire à partir de 2026, contenant des informations sur les caractéristiques, l'origine des composants et les matériaux des voitures électriques).

Nous observons que le français emprunte des termes de spécialité à l'anglais, mais qu'en même temps il y a beaucoup d'adaptations et de créations françaises. Souvent, les anglicismes et les adaptations coexistent au sein d'un même article. Parfois, l'expressivité des emprunts est supérieure.

Tous les ans, l'Académie française identifie les anglicismes à proscrire, qu'elle remplace avec des termes français. Par exemple, pour l'anglicisme *tuning*, dérivé de *to tune*, employé dans le monde de l'automobile avec le sens de « régler un moteur », elle a proposé les équivalents « personnalisation » ou « ajout d'accessoires » (un garage spécialisé dans la personnalisation/*le tuning des camions).

Nous avons mentionné ci-dessus une expression qui est devenue courante de nos jours, appartenant au domaine de la psychologie : *l'angoisse de la panne* ou *l'anxiété de l'autonomie*, calquée sur l'anglais *range anxiety*. En Norvège, « l'angoisse de l'autonomie » a été nommée expression de l'année 2013.

« L'expression "angoisse de l'autonomie" désigne la crainte de manquer de batterie en plein trajet sans pouvoir arriver jusqu'à une borne de recharge. » (<https://www.share-now.com/fr/fr/blog-ev-range-anxiety/>)

Dans un article consacré aux effets des anglicismes sur le système du français, Rey-Debove (1987 : 257) affirmait que « les emprunts à l'anglais ont été les plus nombreux dans l'histoire du français » et que « depuis la fin de la dernière guerre, les mots pris à l'anglais britannique et américain constituent l'essentiel des emprunts en français ». « L'anglais est à l'origine de l'écrasante majorité des emprunts aux langues étrangères (80 %) » (Audureau 2022), surtout dans le domaine des nouvelles technologies et dans celui des questions de société.

Nous avons constaté que dans le secteur des transports et de la mobilité, la plupart des emprunts proviennent de l'anglais. Il y a quand même des néologismes empruntés aux langues scandinaves. Le mot *flygskam*, un néologisme forgé par les Suédois, désigne le sentiment de culpabilité ressenti à l'idée de prendre l'avion. Ces dernières années, en Suède on a enregistré une baisse du nombre de passagers et une diminution des vols, suite à l'urgence climatique. Le titre d'un article du *Monde* contient une paraphrase résumant le concept, étant suivi d'un sous-titre qui donne une explication du contexte dans lequel ce concept a été créé. À l'intérieur de l'article nous retrouvons le néologisme suédois avec son explication en français, « la honte de voler » :

(titre) Baisse du trafic aérien en Suède, plombé par la « honte de voler »

(sous-titre) Face à l'urgence climatique, les Suédois sont de plus en plus nombreux à bouder l'avion et à lui préférer le train, contribuant au déclin du transport aérien dans le royaume scandinave.

« [...] Est-ce l'effet Greta Thunberg, l'icône suédoise de la lutte contre le réchauffement climatique qui traverse actuellement l'Atlantique en bateau, ou bien d'autres facteurs, certains conjoncturels ? Selon les spécialistes suédois du transport aérien, il est encore trop tôt pour le dire. Une chose est sûre : en Suède, l'avion a pris du plomb dans l'aile ces derniers mois et face à la « flygskam » – la honte de voler – le secteur doit s'adapter. » (Le Monde, 23/08/2019)

Soucieux de protéger la planète, les Suédois forgent le terme *tågskryt* (équivalent anglais : train-bragging), à savoir « la fierté de prendre le train » :

« Eh bien, nous voici à présent dans l'ère du *tågskryt*, traduit en anglais par Train-bragging ! Un néologisme, de nouveau, créé par les Suédois. Jamais à court d'idée, celui-ci renvoie à la fierté de prendre le train. Hashtag passager ou réel bouleversement social ? Il semble que ce phénomène ait pris de plus en plus d'ampleur sur les réseaux. » (lyko.blog, 25/01/2023)

Dans un article du *Figaro* portant sur les nouvelles tendances du tourisme durable, la journaliste utilise l'équivalent anglais de ce néologisme, en l'expliquant pour les lecteurs :

(titre) Écotourisme, train-bragging... Huit mots pour être incollable sur le tourisme durable

« [...] À l'inverse du *flygskam*, la honte de prendre l'avion, le train-bragging exprime la fierté, voire la vantardise, de se déplacer en train pour minimiser son empreinte carbone. » (Le Figaro, 20/08/2022)

Géraldine Moinard, directrice de la rédaction des éditions Le Robert affirmait que « le dictionnaire est un reflet de la société, quand on commence à trouver des mots scandinaves, c'est qu'il y a un début d'influence ». (Audureau, 2002)

La plupart des termes scientifiques ou techniques qui entrent dans le vocabulaire général, et par la suite dans les dictionnaires, ont une valeur dénotative. Dans quelques années, tout comme le mot *ordinateur*, les dénominations des véhicules électriques et de leurs accessoires ne seront plus perçues comme des néologismes. Probablement certains mots ne seront plus employés quand le référent sera périmé. Les organes de presse jouent un rôle important dans la diffusion de toutes ces innovations lexicales. Ils mettent en valeur les néologismes en les plaçant dans les titres des articles, en les expliquant dans les sous-titres, en les mettant entre guillemets ou en fournissant des définitions à l'intérieur des articles. Dans les entretiens, les spécialistes sont priés d'expliciter tel ou tel mot nouveau ou bien les représentants des maisons d'édition parlent des indices et des critères selon lesquels ils sélectionnent les mots qui entreront dans les dictionnaires.

En outre, les journalistes créent eux-mêmes des mots nouveaux ou bien ils rapportent les paroles des hommes politiques, des sociologues ou des économistes. De cette façon, le langage s'enrichit de termes à valeur connotative (*démobilité*, *Mobee*).

5. Conclusion

La langue française s'enrichit chaque année de mots nouveaux. Un des domaines les plus innovants du point de vue technique, mais aussi linguistique, est celui des transports et de la mobilité. Nous assistons à la transition vers une mobilité plus

propre et plus durable, ce qui suppose de nombreuses transformations et évolutions de la science, de la technologie et de la société.

La presse écrite et la presse en ligne foisonnent de néologismes. Étant donné le domaine de spécialité, la plupart des nouveaux termes ont une valeur dénotative, car ils dénomment de nouveaux objets et de nouvelles réalités.

En ce qui concerne les procédés de création lexicale, les nouvelles lexies sont formées principalement par dérivation ou composition. Il y a peu d'emprunts directs, en général de l'anglais, et beaucoup de calques et d'adaptations. Cela s'explique par les politiques linguistiques de la France, par la tradition interventionniste et par le travail des organismes de réglementation. Depuis sa création, la commission d'enrichissement de la langue française a joué un rôle important dans le processus d'innovation lexicale.

Le public accorde un intérêt croissant à la protection de l'environnement, il est attiré par les technologies innovantes, c'est pourquoi beaucoup de nouveaux lexèmes auront toutes les chances de s'installer durablement dans le vocabulaire actif et d'entrer dans les dictionnaires. D'autres disparaîtront à cause de l'évolution rapide de la science et de la technique. Il ne faut pas oublier qu'« une lexie est néologique pour quelqu'un, à un moment donné ». (Sablayrolles 2002)

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**SECTION MANAGEMENT, MARKETING, ECONOMIC,
INFORMATICS AND CYBERNETICS**

**FLEXIBLE WORK. TRENDS AND PERSPECTIVES BASED ON
LITERATURE INVESTIGATION**

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Abstract: *The study on flexible work has received increasing interest from researchers since 2000, but especially over the last years, when the coronavirus pandemic turned many people into remote workers overnight. The COVID-19 crisis has forced many employers to let their employees work from home. But what at first was a necessity becomes now a preferred way of working. Remote work allows employees to maintain a good work-life balance. This is essential to being more satisfied at work, and therefore to performing higher quality work. Commuting is not only mentally and physically stressful, but it also takes time, which is a valuable resource for people with busy schedules. Flexible working arrangements also have financial benefits, both for employers and employees; telecommuting allows employees to work from less expensive locations. COVID-19 has been the biggest engine of digital transformation, proving to businesses around the world that employees do not need to be in an office to get their work done. As flexible working becomes more popular due to its benefits, also the research on the topic grows swiftly. This study aims to explore the interest of specialists in investigating topics related to flexible work using bibliometric analysis. We conducted the study based on the investigation of the literature in this field from the Scopus database using the PRISMA methodology. The applications used in the data analysis process are VOSviewer and Microsoft Excel. The study involved the investigation of articles published in the period between 2000 and 2023. The major objective of the bibliometric analysis is the research of the scientific productivity of the literature focused on the subject under investigation.*

Keywords: *flexible work; working from home; remote worker; coronavirus pandemic; benefits; challenges; bibliometric analysis.*

JEL classification: M50; M54.

1. Introduction

In recent years, the concept of flexible work has gained significant traction all around the globe. Flexibility is recognized as one of the major shifts in the future of work and workplaces (Kossek, Gettings, & Misra, 2021). Over the past few years, the pace of flexible work environments has rapidly increased. Work flexibility is a common

denominator of many non-standard arrangements, where workers enjoy more autonomy over how they fulfill their work responsibilities. (Dunn, Munoz, & Jarrahi, 2023). The flexible work arrangements (FWAs), hybrid work model combines both office and remote work; into certain days of the week the employees work in the office and remotely on others. This model gives the employees the flexibility to work from home and also collaborate with their colleagues in the office environment.

Even before the pandemic, in many countries, the remote-capable employees had a hybrid work arrangement. 8% of the U.S. full-time employees worked exclusively from home, 32% had a hybrid work arrangement, while 60% was fully-on site (Wigert, 2022). But the beginning of 2020 was the beginning of the pandemic that has drastically changed the way people work, putting front and center the concept of work from home (WFH) for the majority of employees all over the world.

WFH is a relatively new experience for most workers, including those that manage them. Consequently, there has been an ongoing debate among organizational leaders with those advocating to make WFH a permanent fixture on one end, and those opting for a return to the more traditional, 8 hours-in-the-office on the other end (Kim&Dirks, 2023).

Immediately after the onset of the pandemic, working from home received special attention, with many researchers looking to find ways to increase productivity. The research on the effectiveness of WFH has generally shown that employees are just as, if not more, productive working from home than when they are in the office. According to a recent survey conducted by the Pew Research Center, 44% of respondents shared that WFH has made it easier for them to meet deadlines and get their job done. Studies have demonstrated that productivity for remote workers were consistently higher than those based in the office (Deole, Deter, & Huang 2023, Blahopoulou et al. 2022, Belzunegui-Eraso&Erro-Garcés, 2020). The most of remote-capable employees continued to work from home at least part of the time. While the employees prefer being fully remote, managers have considerable hesitation about this way of working. The compromise is the flexible, hybride work. Most employees have developed an affinity for remote-work flexibility that has grown into an expectation for the future. While permanent plans for remote flexibility are certainly trending in their favor, there are still a fair number of employees who will not receive the flexibility they desire. According to a recent Gallup study (Wigert&Agrawa, 2022), 32% of the employees prefer working exclusively remote, 59% prefer the hybrid work, while only 9% prefer fully on-site jobs. Not only younger generations prefer hybrid work, but also experienced specialists want to work in flexible companies with a modern work style.

FWAs deliver individual and organisational benefits but also challenge the foundations of conventional control strategies, providing circumstances for evading managerial oversight while undermining the mechanisms that reproduce corporate culture (Stirpe, 2023).

Many employees prefer hybrid work to avoid commute time and the stress associated with commuting. They also want to maintain a better work-life balance and have a more comfortable environment. Some employees feel uncomfortable at work because they do not have enough autonomy to make their decisions independently. On the other hand, the hybrid model reduces workplace costs and offer the employer the opportunity to choose talented employees regardless of the region they are from.

Although FWAs are often presented as ‘employer friendly’ initiatives (CIPD, 2022), they also present organisational challenges. Working remotely involves a high risk of communication problems, which means it is essential that the company has the right tools and technologies to lead to effective collaboration. Keeping employees motivated and engaged is also more difficult when employees work from home, and employers must find appropriate strategies to address this issue. Implementing flexible work arrangements can be difficult if companies do not provide employees with the necessary tools. Therefore, it is essential to ensure a proper technological infrastructure in the workplace when implementing flexible work arrangements.

2. Research methodology

In the research we analyzed the interest of specialists in investigating topics related to flexible work using bibliometric analysis.

The research objectives are:

- Identification of the evolution in time of the interest for investigation of flexible work topic
- Identification of the countries have the highest scientific productivity and impact for the field under investigation
- Identification of the journals with the most scientific productivity and impact for the field under investigation

The research carried out is based on a bibliometric analysis of studies related to flexible work topic. “The bibliometric review methodology is important as it provides a categorized view of the documents published in each research area, based on objective criteria for analyzing and classifying publications.” (Cavalcante, Coelho and Bairrada, 2021). Statistical methods have an increasingly important role in the analysis of the flexible work topic. But their value depends on the clarity of reporting. The PRISMA methodology minimizes bad reporting and increases transparency in the way systematic review is conducted (Bulatnikov, Constantin, 2021).

By using PRISMA methodology researchers can improve their reporting of systematic reviews and analyzes based on statistical methods. Starting from these considerations, we used the PRISMA methodology in this research. Thus, inclusion and exclusion criteria are presented in Table 1 and the PRISMA Flow Diagram in Figure 1.

Table 1. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
It must explore at least one topic related to flexible work reflected by the title or the abstract of the paper;	Papers containing the terms flexible work in authors' keywords section but in reality the papers main topic was about something else;
Papers released between 2000 and 2023;	Book, book chapter, letter, conference review, editorial, note, short survey;
Jurnal and Conference Proceedings;	Papers that focused mainly on work topics, but also mentioned the word flexible.

The papers are written in English

In PRISMA Flow Diagram the number of included and excluded articles can be found for every step.

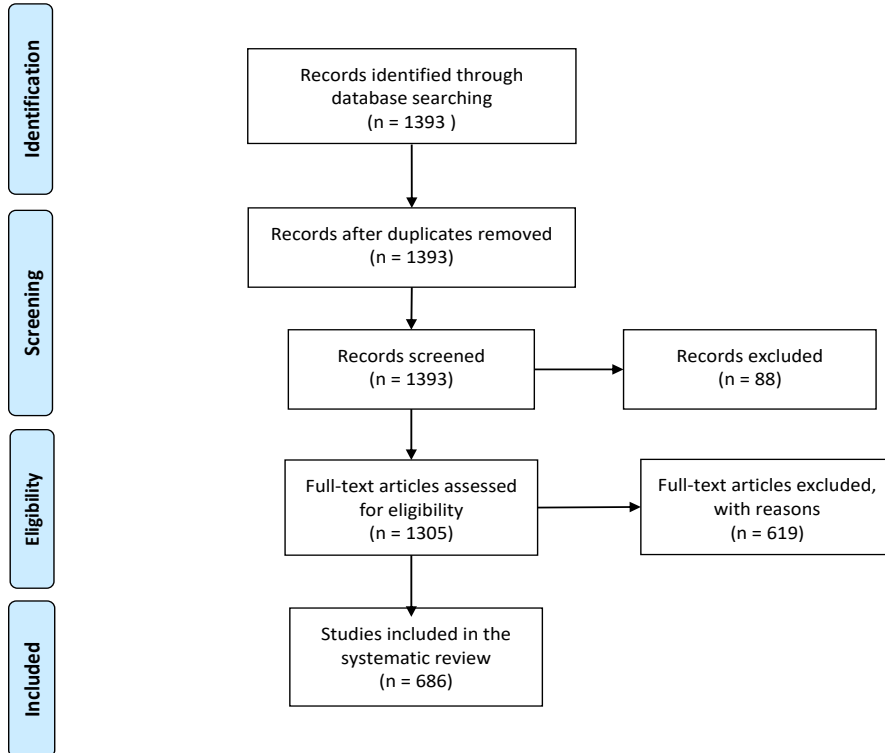


Figure 1. PRISMA Flow Diagram

The data for the research were collected in October 2023 from the Scopus database, this being one of the most important bibliographic databases.

For the veracity of a bibliometric analysis, an important step is the selection of papers. Initially, for the selection of articles from the database we developed the following search algorithm: TITLE-ABS-KEY ("flexible work" OR "hybrid work" OR "remote and in-person work" OR "mix of work from home and office time" OR "split the time between home and office" OR "work from home" OR "teleworking") and we obtained a number of 6.946 results.

Through a refinement of the terms searched, we chose the following searching algorithm: TITLE-ABS-KEY ("flexible work" OR "hybrid work") and we obtained a number of 2.488 results.

To filter the results, we used Year: 2000-2023; Document type: Article, Review and Conference Paper; Source Type: Journal and Conference Proceeding; Subject Area: Business, Management and Accounting, Social Sciences, Economics, Econometrics and Finance, Computer Science; Language: English and we obtained a number of 1393 results.

The selection algorithm used is the following:

```
TITLE-ABS-KEY ( "flexible work" OR "hybrid work" ) AND PUBYEAR > 1999 AND
PUBYEAR < 2024 AND ( LIMIT-TO ( DOCTYPE , "ar" ) OR LIMIT-TO ( DOCTYPE
, "cp" ) OR LIMIT-TO ( DOCTYPE , "re" ) ) AND ( LIMIT-TO ( SRCTYPE , "j" ) OR
LIMIT-TO ( SRCTYPE , "p" ) ) AND ( LIMIT-TO ( SUBJAREA , "SOC" ) OR LIMIT-
TO ( SUBJAREA , "BUSI" ) OR LIMIT-TO ( SUBJAREA , "ECON" ) ) AND ( LIMIT-
TO ( LANGUAGE , "English" ) ) .
```

After excluding the inconclusive journals for the flexible work field, we obtained 1305 results. Also, we analyzed the papers evaluating the title and keywords and kept 686 papers in the database.

3. Data analysis

In order to achieve the research objectives, we performed several analyzes on the database with the selected papers. The software used in the data analysis process are Microsoft Excel and VOSviewer. The results are shown below.

Number of publications by year (2000-2023) - shows the evolution in time of the interest for flexible work topic (Figure 2).

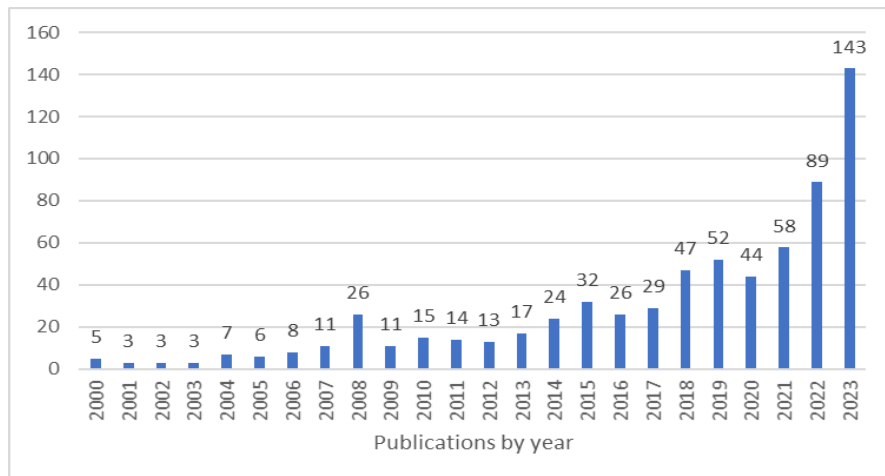


Figure 2: Number of publications by year

Source: own representation

Figure 2 shows us that in the period 2000-2012 the interest for flexible work topic is quite low. A significant increase in this interest is manifested starting with the year 2018. In the year 2023, until October, the number of works ended up being almost three times higher than the one in 2018 and almost two times higher than the one in 2022.

Number of publications by journal - the hierarchy of journals that contain papers with flexible work topic is presented in Figure 3.



Figure 3: Productivity by journal: number of papers published
Source: own representation

A hierarchy of the journals according to the total number of citations that the papers published in a certain journal have is presented in Figure 4. We have included in the diagram journals with a number of citations greater than 200.

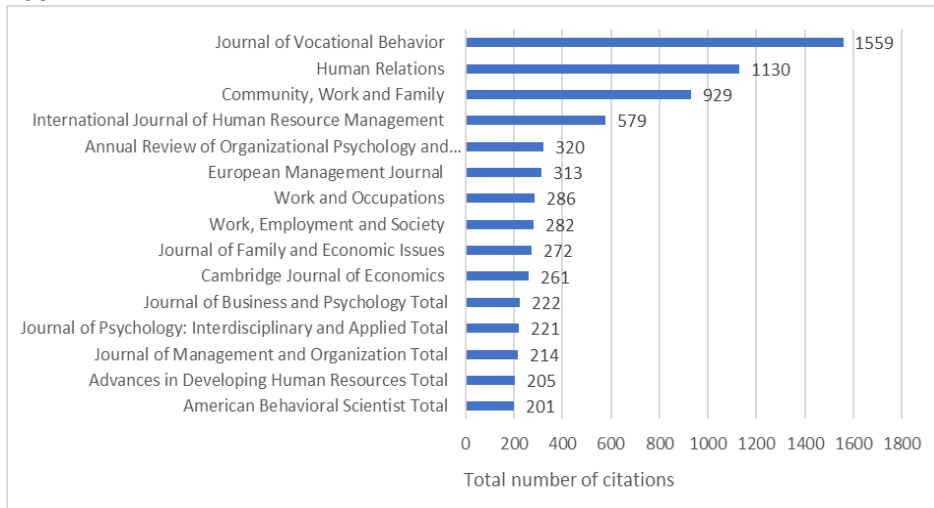


Figure 4: Impact by journal: Total number of citations
Source: own representation

Top 10 journals according to the total number of citations that the papers published in a certain journal have is presented in Table 2.

Table 2: Top 10 journals with the most cited articles.

Journal name	Total number of citations
Journal of Vocational Behavior	1559
Human Relations	1130

Community, Work and Family	929
International Journal of Human Resource Management	579
Annual Review of Organizational Psychology and Organizational Behavior	320
European Management Journal	313
Work and Occupations	286
Work, Employment and Society	282
Journal of Family and Economic Issues	272
Cambridge Journal of Economics	261

Source: own representation

The number of years since publication varies from one article to another. Therefore we also calculated an average of the citations by year. We thus obtained a hierarchy of journals according to the average number of citations by year, which I presented in Figure 5. We included in the diagram journals with an average number of citations per year greater than 20.

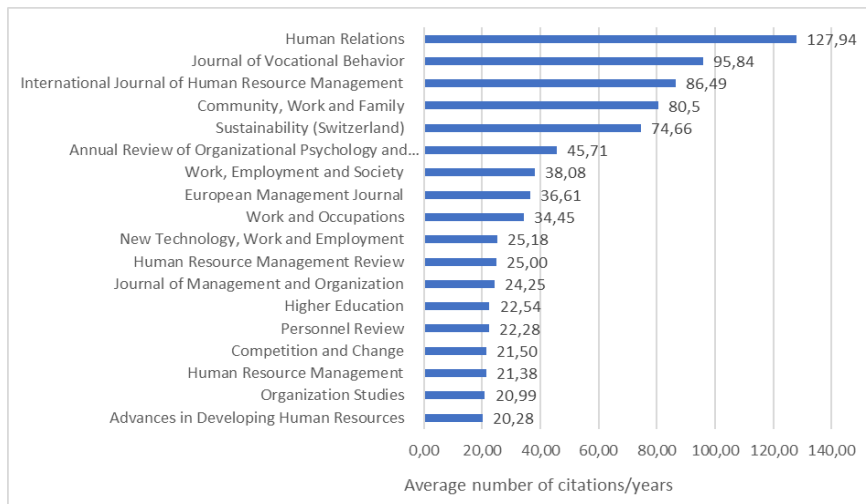


Figure 5: Impact by journal: Average number of citations/year

Source: own representation

Top 10 journals according to the average number of citations by year that the papers published in a certain journal have is presented in Table 3.

Table 3: Top 10 journals with the highest average number of citations/year

Journal name	Average number of citations/year
Human Relations	127,94
Journal of Vocational Behavior	95,84

International Journal of Human Resource Management	86,49
Community, Work and Family	80,5
Sustainability (Switzerland)	74,66
Annual Review of Organizational Psychology and Organizational Behavior	45,71
Work, Employment and Society	38,08
European Management Journal	36,61
Work and Occupations	34,45
New Technology, Work and Employment	25,18

The most cited papers - the papers with great impact, based on the number of citations, which refers to the flexibil work topic. To measure the impact we considered two aspects: the total number of citations per article and the average number of citations/year per article. A hierarchy of papers according to the total number of citations obtained is presented in Table 4. We have included in the table papers with a number of citations greater than 200.

Table 4: The most cited papers: total number of citations

Title	Authors, Year of publication	Journal	Total number of citations
Does it matter where you work? A comparison of how three work venues (traditional office, virtual office, and home office) influence aspects of work and personal/family life	(Hill&Ferris& Martinson, 2003)	Journal of Vocational Behavior	352
Alternative Work Arrangements: Two Images of the New World of Work	(Spreitzer et al., 2017)	Annual Review of Organizational Psychology and Organizational Behavior	320
Defining and conceptualizing workplace flexibility	(Hill et al., 2008)	Community, Work and Family	258
When flexibility helps: Another look at the availability of flexible work arrangements and work-family conflict	(Shockley&Allen, 2007)	Journal of Vocational Behavior	248
Labour market deregulation, 'flexibility' and innovation	(Michie& Sheehan, 2003)	Cambridge Journal of Economics	244

Flexible work arrangements, job satisfaction, and turnover intentions: The mediating role of work-to-family enrichment	(McNall et al., 2009)	Journal of Psychology: Interdisciplinary and Applied	221
Precarious, Informalizing, and Flexible Work: Transforming Concepts and Understandings	(Arnold & Bongiovi, 2013)	American Behavioral Scientist	201

Source: own representation

The papers were published in different years. Therefore we also calculated an average of the citations/year per article. A hierarchy of papers according to the average number of citations/year is presented in Table 5.

We have included in the table papers with a average number of citations/year greater than 20.

Table 5: The most cited papers: average number of citations/year

Title	Authors, Year of publication	Journal	Average nr of citations by year
Alternative Work Arrangements: Two Images of the New World of Work	(Spreitzer et al., 2017)	Annual Review of Organizational Psychology and Organizational Behavior	45,71
Factors influencing home-based telework in Hanoi (Vietnam) during and after the COVID-19 era	(Nguyen, 2021)	Transportation	32
Post-pandemic office work: Perceived challenges and opportunities for a sustainable work environment	(Chafi M. et al., 2022)	Sustainability (Switzerland)	27
Caring human resources management and employee engagement	(Saks, 2022)	Human Resource Management Review	24
Women's employment patterns after childbirth and the perceived access to and use of flexitime and teleworking	(Chung et al., 2018)	Human Relations	22,5

Source: own representation

Country Productivity

The countries with the largest number of published papers are United States of America (354 documents), Australia (144 documents), the United Kingdom (131 documents), Canada (76) and Germany (74 documents). The graphic representation obtained by using the VOSviewer application is presented in Figure 6.

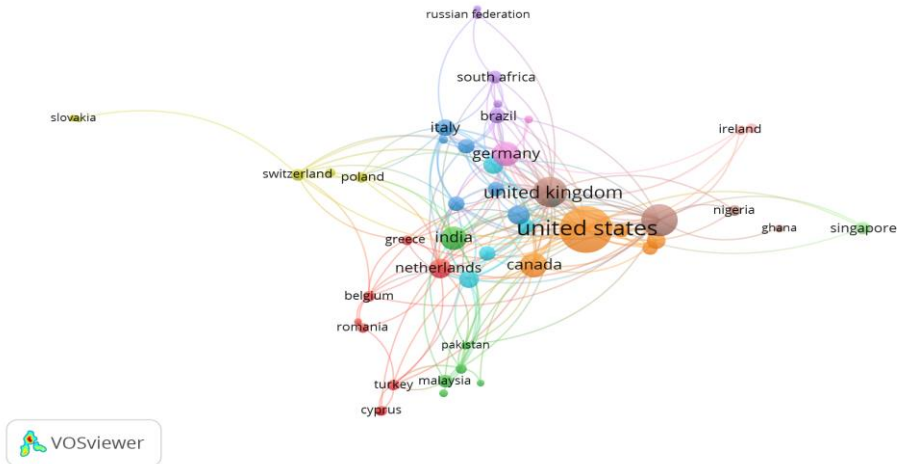


Figure 6: Productivity by country: number of publications.
Source: own representation

Country Impact

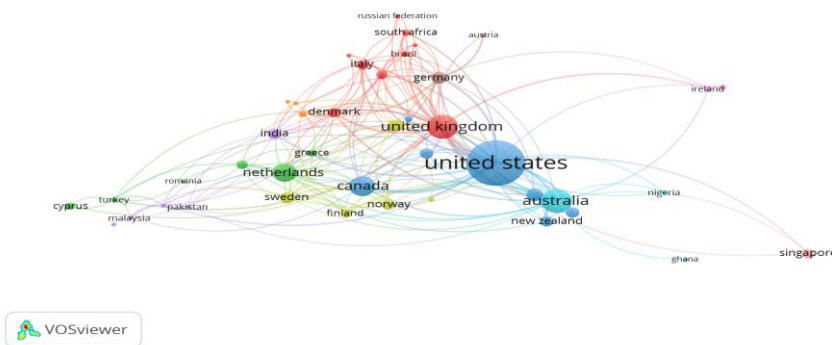


Figure 7: Impact by country: number of citations.
Source: own representation

In terms of impact, determined by the number of citations, the countries with the highest impact of published works are the United States of America (12719 citations), the United Kingdom (3132 citations), Australia (3036 citations), Canada (1992

citations) and Netherlands (1655 citations). The graphic representation obtained by using the VOSviewer application is presented in Figure 7.

4. Conclusion

Today's business world is different from the one before the pandemic and is constantly changing. The hybrid work model replaces the traditional work models in present-day dynamic environment. Combining both in-office and remote work, the hybrid work model combines the advantages of both models. The employees are determined to work when, where and how is best for them. Their workplace must offer a better wellbeing, work-life balance and flexibility. The employees still need to feel connected to their coworkers and their organization. The option to work in-person makes them feel more connected to their team and their organization.

We consider that the use of bibliometric analysis in the field of flexible work can contribute to a better understanding of the trends in the approach to this field. We also consider that the quantitative results generated on the basis of the bibliometric analysis can be established as benchmarks for outlining the framework of qualitative research that would bring even more relevance to the investigated topic.

The results of our research show that of the total of 686 works selected in the database, more than 60% were published in the period 2018-2023. This fact highlights the growing interest of specialists in the field of flexible work in recent years.

According to the results of our study, the journals with the most papers on the subject of flexible work are: International Journal of Human Resource Management, Community, Work and Family and Sustainability. The journals with the greatest impact, from the point of view of the number of citations are: Journal of Vocational Behavior, Human Relations, Community, Work and Family.

Also, scientific productivity on topics related to flexible work places the United States of America in the first place, followed by the Australia and the United Kingdom. Regarding the evolution over time of the number of papers published in the field of flexible work, the year 2018 indicates a time when the number of papers began to increase, the trend continuing until now.

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ASPECTS REGARDING THE INFLUENCE OF MASS MEDIA ON THE HUMAN PSYCHIC SYSTEM OF THE YOUNG CONSUMER FROM A MARKETING PERSPECTIVE

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Abstract: *The current work aims to present the impact of mass media on young people's behaviour from the standpoint of marketing, beginning with an analysis of this impact treated in the specialized literature and continuing with a verification study on a specific group of students. The topics covered in this paper, meant to be the first in a series of deeper investigations into this area, focus on the elements that have an impact on the young consumer's mental system and mass media influence factors, and a study on specific impact elements like video games, smartphones, and social networks, particularly TikTok. The mass media component will focus on both content elements and mass media supports, from their well-established perspectives, such as: television, radio, print, electronic, and Internet media, social networks, telephony, and video games. The target audience for the study will be young people, with a focus on young students from a faculty of economic sciences. The research will attempt to capture the influential aspects of mass media that this audience prefers to access, including the Internet, the most popular social networks, mobile phones, and other commonly used devices.*

Keywords: *young consumer, psychic system, mass media, marketing, social media.*

JEL Classification: *M31.*

1. Introduction

This article aims to delineate the principal components of mass media's impact on the human psychological system of young people. Among the direct influencing factors on the mental system are difficulties in writing, reading, thinking, creative thinking, memory, attention, irascibility, passive attitude, attention, concentration, mental states, social frustration, mental tone, and school performance.

From the standpoint of the research, these categories of factors can be grouped according to particular goals such as: the impact of mass media on perceptions and attitudes (Bandura, Albert (2009), the influence of the mass media on social behaviors and values, respectively on self-image and self-esteem (Perloff, 2014; Jan et al., 2017), the influence of mass media on emotions and affective experiences (Barlett and Gentile, 2015), the influence of mass media on cognitive

and emotional states (Reid and Reid, 2007), the influence of mass media on social interactions and communication (Walther *et al.*, 2010). Numerous examples of how the mass media affects people's mental health can be found in the specialized literature. Among the components of mass media with a direct impact on psychological phenomena and processes, the Internet plays an increasingly important role in terms of influences on behaviour (Babutsidze *et al.*, 2023).

Social networks, as a component of the online environment, can have a profound effect on people's mental health in terms of addiction and overload, social comparison, emotional distress, online harassment and bullying, the spread of false information, and negative effects on sleep and physical well-being.

Numerous studies have examined the effects of social media in the context of marketing, emphasizing its critical role in shaping human behavior and the psychological system (Alsaleh *et al.*, 2019, Chahal *et al.*, 2020, Jamil *et al.*, 2022). Also, among the components of social media, studies have investigated the general influences of Facebook (Luarn *et al.*, 2015, Clark and Çalli, 2014), Twitter/X (Cerasi *et al.*, 2023), Instagram (Torregrosa *et al.*, 2023, Ramdani and Belgiawan, 2023), YouTube (Dehghani *et al.*, 2016), TikTok (Meng and Leung, 2021, Wahid *et al.*, 2023) on behaviors and mental processes.

2. Research Methodology and Results

The aim of the study is to examine, from a marketing perspective, how young people interact with mass media and how this influences their behavior. Based on a survey with a 30-question questionnaire, the current study is descriptive in nature. The target population subjected to the research consists of students of the Faculty of Economic Sciences, University of Oradea. After administering the questionnaire to 101 respondents, the sample ultimately comprised 99 respondents. The demographic and psychographic characteristics of the respondents are shown in Table 1. The research aims to achieve the following goals:

O1: Exploring how youth engage with and perceive mass media interactions

O2: Analysis of some aspects of young people's Internet behavior

O3: Defining broad characteristics of youths' interactions with social media

Table 1: Demographic and psychographic characteristics of respondents

Variables		No. of respondents	%
Gender (n=99)	female	74	74,75%
	male	25	25,25%
Age groups (n=94)	<21	13	13,83%
	21	19	20,21%
	22	20	21,27%
	23	16	17,02%
	>23	26	27,67%
Residential environment (n=98)	urban	57	58,16%
	rural	41	41,84%
Temperament type (n=98)	choleric	27	27,55%
	phlegmatic	14	14,28%
	melancholic	27	27,55%

	sanguine	30	30,62%
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Source: Own research

O1: Exploring how youth engage with and perceive mass media interactions.

This objective seeks to explore how young people perceive the mass media's influence on them. To achieve the objective the questionnaire included four questions.

For the question "How much do you think the mass media influences your behaviour?", the score obtained is 3.18 on a 5-point scale, indicating that the perceived influence of the mass media is rather average. This result is consistent with the score of 2.83 obtained for the question "On a scale of 1 to 5, how do you rate the influence of mass media on yourself?", the variable was also measured on a 5-point scale.

In order to understand the influence of the mass media on young people, the respondents were asked to rank, in order of importance, the functions of the mass media in their activity (education, information, manipulation, other options). Using the rank order scaling, the resulting hierarchy indicated the information function in the first place (69.7% of the respondents placed the information function in the first place), the education function in the second position (58.11% of the respondents placed this function second), respectively manipulation appears third in the hierarchy (Figure 1).

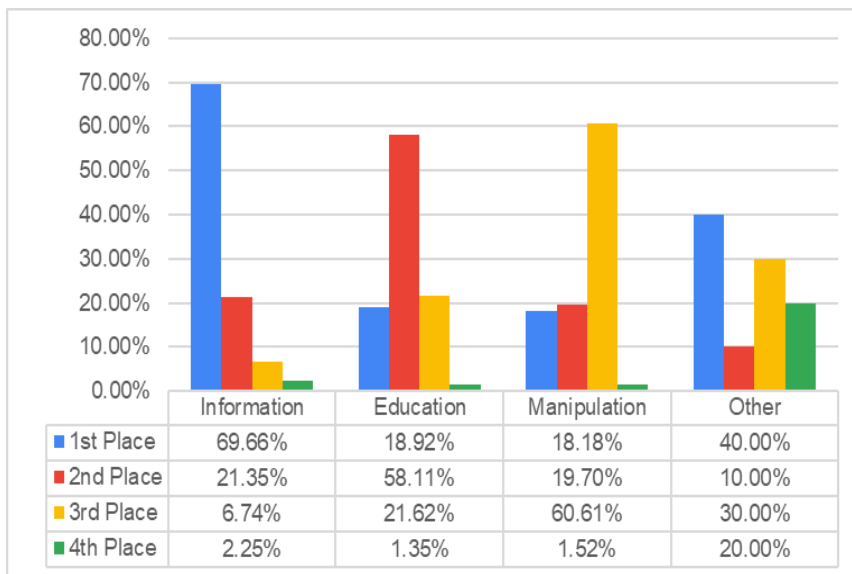


Figure 1: Hierarchy of mass media functions.

Source: Own research.

The assessment of the usefulness of the information provided by the mass media indicated that 81.82% of the respondents appreciated this information as useful. We believe this value is consistent with the answer to the previous question, which valued information as the most important function of mass media among the three functions assessed in this study.

In the context of evaluating the usefulness of information found in mass media, we compared the respondents' perceptions of it according to gender (Table 2).

Table 2: Gender-based comparative analysis of mass media information usefulness

Do you find the information provided by mass media sources useful?	Yes	No
Female	86.49%	13.51%
Male	68.00%	32.00%
Total	81.82%	18.18%

Source: Own research

Gender variations in the perception of information usefulness are noticeable at the sample level. Female respondents seem to appreciate the usefulness of information to a greater extent compared to male respondents. To be able to generalize the result at the level of the entire population targeted by the study, we used the t-test for difference in proportions that indicates a statistically significant difference between the two analyzed groups ($P(F \leq f)$ one-tail 0.037, value which is less than 0.05). As a result, we can extrapolate the findings to the entire study population, with female students perceiving to a greater extent than male students that mass media information is useful.

The analysis of the mass media channels considered by young people as having the greatest influence on them (Table 3) indicates the following order: the Internet (40%), social media (39%), and only after them are ranked the traditional mass media channels (TV - 11%, press - 5%, and radio - 4%). We wanted to emphasize the influence of social media, so we decided to examine the Internet and social media separately.

Table 3: Which mass media channels influence you the most?

Which mass media channels influence you the most?	
Internet	40.40%
Social media	39.39%
Tv	11.11%
Press	5.05%
Radio	4.04%
Total	100.00%

Source: Own research

O2: Analysis of some aspects of young people's Internet behavior

The results of the current study on aspects of young people's behavior on the Internet indicate the following:

- time spent on the Internet: the results of the study show that more than 70% of respondents spend more than two hours a day on the Internet. Of these, more than 28% spend more than 4 hours a day online (Table 4).
- the main reason the respondents access the Internet: Regarding the reasons why the respondents of the study access the Internet, we aimed to identify the main reasons (Table 5). Searching for information on the Internet is the main reason

for 44% of respondents. On the other hand, for 33% the main reason is to waste time.

Table 4: The time spent on the Internet during a day

The time spent on the Internet during a day	% of total respondents
under 30 minutes	2.04%
30 minutes - one hour	6.12%
one hour - two hours	19.39%
two hours - four hours	43.88%
more than 4 hours	28.57%
Total	100.00%

Source: Own research

Table 5: The main reason for accessing the Internet

The main reason for accessing the Internet	% of total respondents
to search for information	44.90%
to waste time	33.67%
to play	10.20%
for no particular reason	8.16%
for work	3.06%
Total	100.00%

Source: Own research

- study's objectives concern the addiction to Internet games or video games and the time spent on them. In terms of time spent on playing Internet and/or video games per day, more than 60% of respondents say they spend no time on these activities at all, and only about 13% spend more than two hours a day playing such games.
- regarding the degree of addiction to Internet games or video games, this variable was measured on a scale from 1 to 3, with variants from a low degree of addiction to a high degree of addiction. The score obtained is 1.25, which indicates that the respondents appreciate that they have a low degree of addiction to the Internet and/or video games. This result is in accordance with the value obtained in the previous question, according to which more than 60% of the respondents state that they do not play games on the Internet or video games.

O3: Defining broad characteristics of youths' interactions with social media

An important objective of the research aims to examine some aspects related to the interaction of young people with social media. In this context, the following aspects were analyzed:

- the main device used to connect to social media (Table 6): the primary device used to access social media, according to nearly 90% of respondents, is a smartphone;

Table 6: The main device used to connect to social media

Main device used to connect to social media (N=99)	% of total respondents
Smartphone	89.90%
PC	5.05%
Laptop	5.05%
Total	100%

Source: Own research

- social media addiction (as it is perceived by the respondents): According to respondents' perceptions, the degree of addiction to social media was 1.80, assessed on a three-point Likert scale. This value suggests that social media addiction is viewed as low to medium at the sample level (Table 7).

Table 7: The degree of addiction to social media

social media addiction (N=99)	% of total respondents
highly addicted	16.16%
moderately addicted	47.48%
low addicted	36.36%
Total	100%

Source: Own research

- the most searched topics in social media: regarding the most searched topics in social media, the results of the study show that the most frequently searched were those from the categories news (14 appearances), general information (13 appearances) and fashion (9 appearances) (Figure 2).



Figure 2: The most searched topics in social media.

Source: Own research.

- the most accessed social networks: According to the results of the study, the top 3 most accessed networks are: Instagram (54% of respondents mentioned that Instagram is the social network they access most frequently), Facebook (32%) and TikTok (9%) (Table 8).

Table 8: The most accessed social networks

The most accessed social networks (N=99)	% of total respondents
Instagram	54.54%
Facebook	32.33%
TikTok	9.091%
Linkedin	2.02%
Pinterest	1.01%
Youtube	1.01%
Total	100%

Source: Own research

Analyzing how the respondents refer to TikTok, the study shows that 42% of the respondents claim that they do not spend time on TikTok at all, and 13% spend approximately one hour a day on TikTok. This result is consistent with other findings related to the use of TikTok, namely: 58% of respondents say that the impact of using TikTok on them is rather negative, and in terms of the degree of addiction to TikTok, the score obtained on a scale of 5 levels is 2.14, which indicates that, on average, respondents rate that they are not addicted to using TikTok.

An aspect considered interesting to explore within the framework of this study is the evaluation of a possible relationship between the level of social media addiction and the temperament of the respondents, evaluated through the lens of how the respondents perceive these variables. The crosstab for the two variables was first created (Table 9).

Table 9: Cross Tabulation: Temperament type & How would you rate your time spent on social media in terms of addiction

Temperament type	How would you rate your time spent on social media in terms of addiction? (N=98)			
	highly addicted	moderately addicted	low addicted	Total
Choleric	3.70%	37.04%	59.26%	100.00%
Phlegmatic	21.43%	42.86%	35.71%	100.00%
Melancholic	25.93%	55.56%	18.52%	100.00%
Sanguine	16.67%	50.00%	33.33%	100.00%
Grand Total	16.33%	46.94%	36.73%	100.00%

Source: Own research

At the sample level, a possible correlation between the two variables could be observed. As shown in Table 8, a higher number of respondents with choleric

temperament rated themselves as having a low degree of social media addiction compared to the other temperament types. The chi-square test was used to examine the relationship between variables, but, at the level of the target population, we could not generalize this result ($p=0.0677$, p -value greater than 0.05). So, we may conclude that, according to the current study, there was no significant relationship between the type of temperament and the addiction to social media.

5. In conclusion

The results of this study should be interpreted in the light of the fact that it was designed as a pilot project to open perspectives for further studies in the context of the topic addressed. The target population subjected to the research consists of students of the Faculty of Economic Sciences, University of Oradea. According to this study, the students' perception of mass media influence on behavior is rated as moderate and a gender-based analysis shows female students perceive mass media information as more useful than male students. Regarding Internet behavior, it is worth mentioning that the main reasons for Internet usage are information search and time-wasting. Some interesting findings regarding students' Interactions with Social Media are: social media addiction is perceived by the students as low to moderate; the top 3 most accessed social networks are Instagram, Facebook, TikTok; and it seems there is no significant relationship found between temperament types and social media addiction. We appreciate that this type of research, meant to provide insights into young people's interactions with mass media in general, and social media in particular, can be a valuable resource for marketers interested in understanding the dynamics of young people's media engagement.

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HOW TO BUILD HR CONTROLLING METRICS, SIMPLY & EASY-TO-USE?

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Abstract: *The descriptive field study showcases how the HR controlling “Key Performance Indicators” of an industry leading company (Ongropack Ltd.) have evolved step by step from the state without professional history to the professional level. The milestones are presented in a clear tabular form. Finally, I set up a simple, transparent and efficient dashboard version of the KPI structure (completed with rarely published real company data). The sole source of the field study is the data collection from company databases and HR documents, according to the social constructionist research methodology.*

Keywords: *HR controlling; KPI; decision making; management report; field study*

JEL classification: *M50*

1. A brief introduction to Ongropack

Ongropack Ltd. is a 100% Hungarian owned company with 93% export rate (worldwide). Main activities: PVC based plastics processing and trading. Average growth rate (sales volume+revenue+EBITDA average) over the last 10 years: 12%/year. Products: Folpack film for the packaging industry, blister film for the pharmaceutical industry, sheet & insulation for the construction industry, foam sheet for the advertising industry.

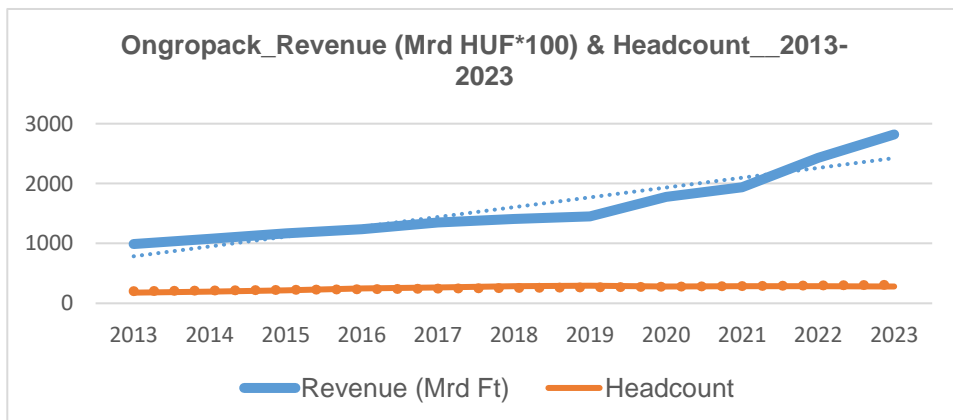


Figure 1

2. The development and evolution of the HR controlling system at Ongropack Ltd.

2.1. "Prehistory" 1993-2008

Company history: The independent company BC- Ongropack Kft is formed from BorsodChem Zrt Plastics Processing Plant I-II (owner: BorsodChem Zrt), static company performance, market stagnation.

HR: no independent corporate HR manager and department, passive controlling functions are performed by the HR Department of the parent company BorsodChem, if necessary.

HR controlling: no Ongropack specific HR controlling, monthly and year-end accounting data requests (statistical headcount, total labour cost), individual ad hoc executive / CFO data requests from BC HR Department, data source: payroll/accounting_Pyramid payroll system.

2.2 "Middle Age" 2009-2013

Company history: 2008-2011 credit market/financial/financial crisis, company stagnating, company's business value declining. BC-Ongropack Ltd. sold by BC parent company at a discount to former BC CEO. The company transferred to Hungarian (local) ownership with significant international management know-how in 2009. The "Ongropack growth trajectory" program is launched, with 10-15% rapid growth per year.

HR: independent corporate HR manager position created, no separate department ("one-man HR"), HR functions are not profiled (e.g. includes full EU tender administration and management of cleaning team)

HR Controlling: no separate HR Controlling function, individual ad hoc HR manager/executive/ CFO data requests from BC HR Department, data source: Payroll/Accounting, Pyramid payroll system, new reports from data processed by HR Manager (headcount, labour costs by plant, age, education)

2.3 "Modern History " - 2014-2017

Company history: Ongropack's dynamic growth phase continues, with growth already reaching 15-20% per year; the work organisation, operational and decision-making practices of the company are undergoing significant changes. The company "outgrows" its site, a new greenfield site is built 20 km south of the headquarters. Wage administration in BC replaced by Workforce then Prohuman (both: outsourcing)

HR: HR manager change (quality change), one-person HR remains; profiling and classical 3-structured task provisioning emerges (recruitment, labour, training), HR process improvement (Best Practice approach), 1 HR trainee appears, expansion to 2 offices by arbitrary office occupancy (Front-Office solution emerging), independent HR controlling task provisioning emerges (KPIs and reporting matrix agreed with management). October 2016: external service provider Nexon payroll software pulled from "Status database" with fixed data structure provided by HR - partial independence from outsourced payroll, immediate reporting option opened. August 2017: first Dashboard indicators released (headcount, turnover).

HR controlling: independent HR controlling is in place (HR manager's job description includes controlling tasks), KPI and reporting matrix developed (management report,

qualification report, job descriptions, turnover and causes, etc.), positive feedback from management and external ISO auditors. Data source: outsourced payroll, Nexon payroll system, HR controlling structured data report requested by HR manager from service providers, recent reports from processed data

2.4 "Contemporary History" - 2018-2023

Company history: An era of radical environmental change! 2015- migration, 2017-2021- phased relocation, 2020-2022- COVID, 2021- commodity inflation 2022- war and energy price hikes

HR: HR position significantly strengthened, work organisation established (one-person HR to 6-person HR), differentiated tasking (Business Partner type tasking), strong separation of disciplines, shift from multitask to functional tasking, HR controlling reporting system further developed, emergence of project management controlling reports supporting decisions on crisis management projects. HR becomes an "expert" and member of the "narrow decision making cabinet", department involved in ex ante norm checking; ad hoc reports are produced faster; HR reaction time and task delivery speed increases 2.5x. Payroll and thus the case management database will be brought in-house in 2022 after 3 years of preparatory work!

HR controlling: to "HR controlling report". Significant increase in prestige, HR manager in addition to HR employee in charge of payroll also learns HR controlling tasks (quasi HR Controlling Group), payroll database (huge unfiltered data repository) brought in-house, HR masters company-specific data mining, HR controlling report continuously improved according to management needs. Task delivery efficiency continues to increase (first in the area of labour cost savings, now in the area of recruitment). All active sub-systems built, all data needs met. 24 individual ad hoc reports/analyses requested from management March-April 2020, 4 projects with KPIs (staff rationalisation, leave and working time management, Home Office / teleworking, short-time working, Research & Development- Innovation wage support) launched within COVID main project chapter; daily cycle reporting at "corporate operativ trunk" meeting. Provide reports requested by managers, accurately, timely, with objective data, visualized. Confidence deepened, HR controlling valid and relevant.

2.5 "Futuristic Age" - 2024-

Company history: environmental changes with accelerating dynamics and increasing amplitude ("spin off"), long-term vision and decreasing time horizon coexistence of challenge-managing micro-project mixes, simulation-type decision making and the need for continuous measurement and data analysis is intensified. A 5% annual growth rate and a 10% reinvestment rate are planned.

HR Controlling: simulation-modelling functionality will be added to the task provisioning; statements will be interactively modified and restructured.

3. Development of the HR controlling indicator system at Ongropack Ltd.

Date	Change in HR controlling metrics
1 January 2009	The independent Ongropack Kft. starts its activity, legally separated from the parent company BorsodChem Chemical Co. The company is on a "growth path". Number of employees: 138.
12 January 2009.	The weekly "Management meeting" system is launched; ad-hoc topics, running text descriptions, not even a separation by department. <u>NO HR REPORTS</u> . HR role is just administrative: taking meeting minutes and sending reminders.
25 May 2009	For the first time, a separate <u>HR TOPIC REPORT</u> appears among the mixed themes, marked with a "scoop"; thereafter, there are rare HR reports with ad hoc topical issues, including a lot of <u>NON-PROFESSIONAL INFORMATION</u> (e.g. cleaning tasks, state of buildings, tenders for machinery). The next report on 31 August 2009 is related to the submission of a tender for machinery; there are no more HR reports in 2009. In the 2nd year of operation of the autonomous company, HR topics appear only on the following dates: 26.02.2010, 29.09.2010, 13.10.2010, as ad hoc reports: e.g. English course starts, no priority order, <u>NO KPIs</u>
2014-2016	Acquisition of a new site territory and architectural design of the greenfield site
13 May 2014	The Managing Director's "Personnel Assistant" takes over from HR the task of taking meeting minutes.
January 5, 2015	<u>PERMANENT WEEKLY HR REPORTING</u> is launched according to the classic threefold thematic division of (1) headcount, (2) recruitment, (3) labour. The report chapters are written in a running text yet. Regular <u>MONTHLY LABOUR COST REPORT</u> is published at the first time!
November 2, 2015	<u>DATA FOCUSED REPORTING</u> : no unnecessary words or phrases, only relevant data are reported.
2016-2018	New greenfield project construction work under process
11 January 2016	Measuring the rate of fluctuation (OP innovation: number of voluntary leavers / current annual statistical headcount / 52*current number of weeks), + previous 12 months' statistical headcount
January 4, 2016	Recruitment_Number of open positions are presented
1 February 2016	Recruitment_Which plant are we recruiting to?
4 April 2016	Riport_Recruitment is a separate chapter, separated from the headcount chapter!
2 May 2016	Labour_Turnover rate of key staff ("know-how shareholders") (shown separately in the total turnover report)

1 August 2016	Labour_Number/percentage of inactive hours (inactive, unjustified, certified unpaid, leave)
3 October 2016	Key Performance Indicators are visualised by colour
2017-2021	Relocation from Kazincbarcika to Szirmabesenyő
5 January 2018	Riport_DASHBOARD!, visualisation of the data of the last 12 months. Headcount_separate rehab separation (management needs to define as a new KPI), atypical employment will be reported separately: retired employees and temporary workers
12 January 2018.	Headcount_statistical headcount, staff turnover Recruitment_number of active open positions
22 January 2018	the weekly report name has changed to <u>HR CONTROLLING REPORT</u> . Recruitment_number of successful recruitments in the latest week.
29 January 2018	Labour_previous year's headcount (KPI for public support)
16 April 2018 - 4 April 2022	Labour_headcount of persons employed in the new site / in the old site.
27 November 2018	Recruitment_changes in the open positions (dynamic analysis) from the beginning to the end of the week, number of positions filled
6 February 2019	Recruitment_job offer acceptance status: accepted or rejected by candidate, or under negotiation
25 March 2019	Statistical headcount_data of previous month also presented
18 June 2019	Headcount_separation: school cooperative (trainee and student work are separated)
3 Feb 2020	Headcount_separation: number of students in dual training
4 March 2020	First COVID case in Hungary
23 March 2020- 31 December 2020	Temporary Covid report: out patient:0/ hospitalisation:0/ quarantine: 0/ suspected Covid: 3/ voluntary home quarantine:5/ sent home from work:2, / Home Office: 8
14 October 2020	Number of students_separation: headcount of training students (secondary technical school/higher education)
February 2022	Russian-Ukrainian war breaks out, turnover rate spikes to 30%, newcomers suddenly drop out
29 August 2022	Labour_new fluctuation indicator: number, rate of turnover within 60 days; follow-up by onboarding questionnaire
1 September 2022	Recruitment_job offer acceptance, by name: offer accepted: candidate x, rejected: candidate y, in negotiation: candidate z
6 November 2023	Headcount: 319; Athypical employment 15%, Labour cost/ revenue: 8,5 %; Training penetration: 61%; Fluctuation: 28%

4. Suggested sample of the general HR controlling KPI system_report matrix

HR controlling system_report matrix											
What?			KPI (Key Performance Indicator)				How often?				
Level I	Level II	Level III	Metrics	Plan	Fact	Variance	Y	Q	M	W	ad hoc
Headcount	Daily HC		number	270	269	1,00				x	
	Statistical HC		number	275	271	0,99			x		
	Recruitment	Efficiency	open position filled /	12	11	0,92				x	
	Job classification (HAY rates)		number	31	33	1,06	x				
	Fluctuation	Reasons	rate/ latest 12 month	0,25	0,28	1,12				x	
	Turnover		Rate	0,45	0,67	1,49			x		
	Demography	Age, sex, residence, blue-white-collar, average length of employment, disabled	cross-sectional survey	1	0,9	0,9	x				x
Labour cost	Completed working hours	Cost revenue (/employee)	number	46980	40072	0,85	x		x		
	Inactive hours	Cost revenue (/employee)	number	7047	7399	1,05			x		x
	Accidents		cumulated number/year	5	6	1,20	x		x		
	Number of hours lost due to accidents	Cost revenue /	cumulated number/year	400	387	0,97			x		
	Paid leave / holiday		balance / day	607,5	511	0,84			x		
	Overtime	Cost revenue (/employee)	number	6443,6	9700	1,51		x	x		x
	Travel expenses	Cost revenue /	Amont (Mft)	4,5	4,4	0,98	x		x		x
Training	Hard skill/soft skill trainings	of wich: internal / external; EU source	number	41	35	0,85	x	x			

	Training hours		cumulated number	13500	11712	0,87	x	x			
	Costs		amount (MEur)	5,3	4,7	0,89	x	x			
	Company penetration		rate	0,25	0,19	0,76	x				
	Skills	of which: obtained in company	cross-section analysis	0,3	0,3	1,00	x				x

5. Conclusion

- In a turbulently changing environment like this (2015-Arab Spring, 2020-COVID, 2022- war, 2022-2023 commodity and energy inflation), the need for data-driven decision making in the work organisation of companies is dynamically increasing. In all cases, the aim is to support the accuracy of "navigation" between "storms" and "black swan" to reduce the reaction time in the decision-making process.
- In a system of value streams assigned and restructured according to corporate objectives, the controlling approach is playing an increasing role and becomes the management framework for data-driven decision-making mechanisms.
- The controlling decision-making process repositions the organisational units as well. Departments that provide shorter reaction times, more professional, valid, sophisticated, relevant and understandable reports will be in a better position in the internal competition for trust and validity.
- The individual style, interests and management techniques of the head of the organisation also have just a little bias and influence on the perception of the usefulness and added value of the data analysis unit.
- The digital IT data storage allows the accumulation and theoretical maximisation of data and information needed for the decision-making process.
- Data literacy, visualisation and reporting capabilities becomes essential for classifying, processing, analysing and transforming accumulated but often unstructured data, set into information.
- Dashboard reports, based on the Balanced Scorecard approach, can play an increasing role in corporate decision making, corporate PDCA cycle management and "navigation".
- HR Controlling has a key role to play in the spread of the Balanced Scorecard approach. The meeting of this two aspects reinforces each other, supporting the continuous quantitative, in-depth and qualitative development of HR controlling metrics.

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