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ARTICLES

The World Order Challenges and the Main Risks of European Integration

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Abstract: This paper is dedicated to the World Economic Order and to its evolution since the end of the Second World War, while showing its influence on the European Union's position as one of the key global actors. The author highlights also the new phase of the Global Order and the main forces that drive a new system of international relations under the strength of regionalization. At the same time, the position of the EU under the pressure of the main challenging forces has been analysed by the author, after more than 15 years since the eruption and spreading of the deepest financial international crises of the last century. The 2008 international financial crash and the post-crisis period embodied a seismic shock to the world economy in the form of a deep economic recession. It is important in the rapidly changing world that the EU Member States take the necessary measures to increase their competitiveness position in the world.

Key-Words: New World Economic Order, Trade, Integration, Liberalization, Technological Innovations

JEL Classification: F10, F15, F60, F62, O10

1. Introduction¹

The various overlapping crises registered in different corners of the world have proved the necessity of the adapting of the World Order to multipolar forces. The 2008 global financial crash and the post-crash period embodied a seismic shock to the world economy. Over 15 years after the crash, an alternative global order that is necessary to adapt to the transformations has not yet emerged. Instead, a new era of global disorder has been released, characterized by a long period of low economic growth, even a relative stagnation of the global economy, and political instability. European integration continues in this changing environment and it must adapt rapidly according to convergence objectives at the level of the Single Market and Eurozone economy. If we return to the first steps of the functioning of the European Single Market we notice that the objectives of European integration have been decisively shaped by the global order based on post-war liberalism. Previous phases of European vertical and horizontal integration were profoundly shaped by the successive post-war embedded liberal and neoliberal US-led global orders.

2. What are the world's major changes?

The post-war order has been based on two main trading systems: the old North-South system, and the new intra-North system. Liberal trade policies have been reflected by several key factors of structural changes. They have encouraged trade openness and rapid economic growth worldwide. The main transforming factors in the world are determined by the massive volume of foreign direct investment (FDI), the substantial participation of the developing countries in the global markets, and the increasing role of the transnational corporations (TNC) that determined a gradual but visible reduction of the GDP gap worldwide.

¹ The paper was presented at the trilateral Roundtable *Adjustment of the CEE Economies to Long-Term Challenges and Overlapping Crises*, organized online by the Institute for World Economy, Romanian Academy, November 9, 2023.

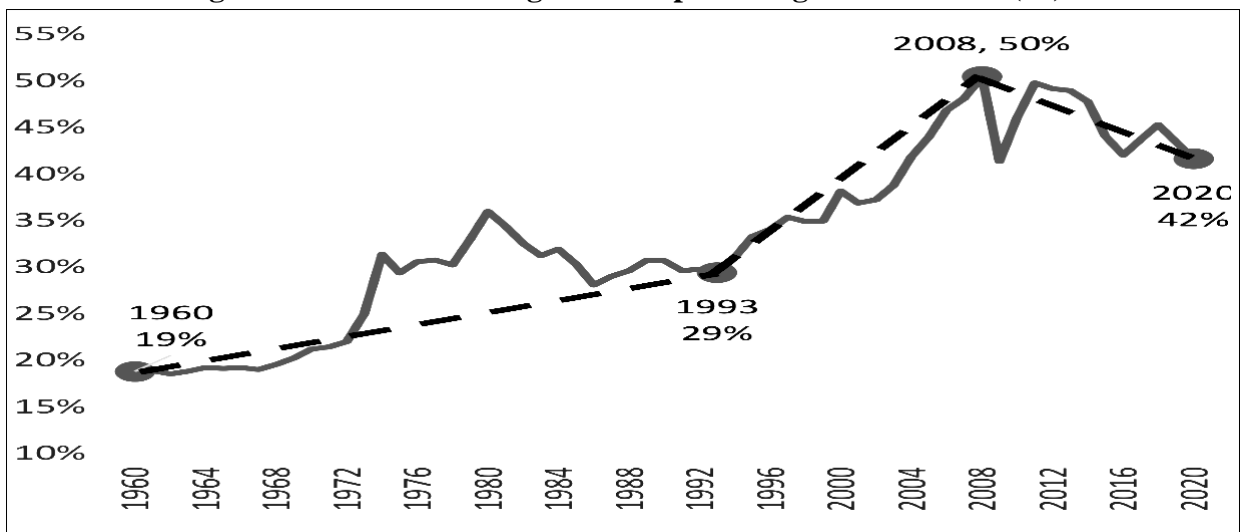
Figure 1: World major changes and actors



Source: Figure elaborated by the author.

Integration with the world economy has been an important part of economic strategies and political development for small and poor economies from the developing group, while for large economies like India and China the opening-up and integration necessity took shape later (Sachs and Warner 1995; Collier and Gunning 1999). As underscored by the following Figure, trade has been one of the main channels of integration into the world economy and, simultaneously, a significant driver of economic growth. The liberal order stimulates an exponential increase in world trade. In Figure 2, we notice the rapid and consistent increase of world trade in goods as a share of world GDP from only 19 percent in 1960 to 42 percent in 2020, with a peak of 50 percent in 2008 when the international financial crash erupted. In absolute terms, we can see a very dynamic increase in world exports.

Figure 2: World trade in goods as a percentage of total GDP (%)



Source: <https://www.macrotrends.net/countries/TCD/chad/trade-gdp-ratio>. Chad Trade to GDP Ratio 1960-2023, www.macrotrends.net. Retrieved 2023-10-11.

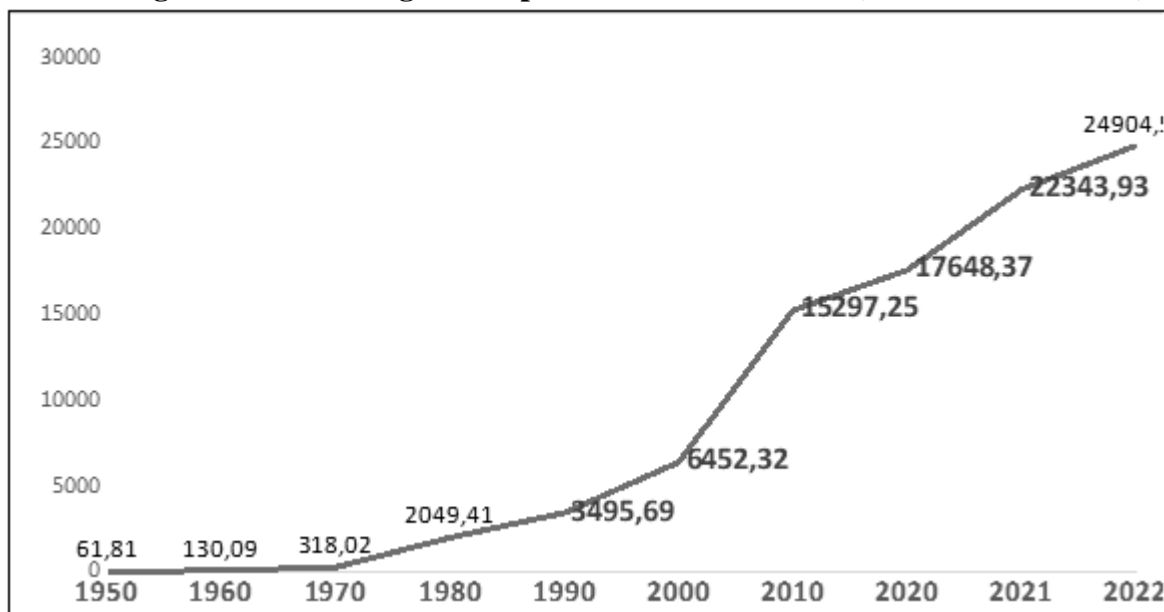
All these features have influenced and stimulated the European integration process. Starting with the '70s the EU was enlarged in 7 different stages: the first in 1973 when 3 developed Western countries obtained full

membership, in the '80s other two enlargements in the South of Europe, and in the '90s we saw an enlargement that incorporated three countries that visibly increased the total EU GDP, in 2004 the 10 “big bang enlargement”, in 2007 the full membership of Romania and Bulgaria and the latest the receiving of Croatia. Meantime the EU lost the UK and this is not a small loss.

The decade before the crisis was marked by the rise of the so-called emerging countries, especially China with two-double digit economic growth rates. This “emergence” is driven by a new organization of production, with different segments spread over several countries, from the design stage to production, delivery, and supply to the end consumer. The “global value chains” are established under the guidance of multinational firms that spread their dominance on the global economy. A smartphone is now designed, produced, and marketed by workers at the four corners of the earth.

Figure 3 shows an increase of over 400% of the world's goods exports since 1960. The most dynamic increase of 237% was registered only in the 2000-2010 decade. This rapid and unprecedented growth was fuelled mainly by China's double-digit economic growth and the other emerging countries by boosting demand for commodities and raw materials internationally.

Figure 3: Trends in global exports from 1950 to 2022 (in billion US dollars)



Source: <https://www.macrotrends.net/countries/TCD/chad/trade-gdp-ratio>. Chad Trade to GDP Ratio 1960-2023, www.macrotrends.net. Retrieved 2023-10-11.

3. The new world order - leading factors

The world economic history shows that evolution from one stage to another is not a static process, it happens in several years and even decades. In my opinion, we are now in a transitory period since the 2008 financial crash. But the main facts that determined the actual period were marked by some events. Before 2001 (the year China joined the WTO), around 80 percent of countries had a larger volume of merchandise trade with the USA than with China. But by 2018, only 30 percent of world countries had traded more with the USA than they did with China. Nowadays China the leading trade partner to more than 120 countries (Green, 2023).

The rapid and long-term high GDP and trade growth rates have determined a visible shifting of economic power centre to the Southeast Asian countries. On the top TNC rankings Chinese companies gain important positions.

Gradually the turnover of some TNCs have exceeded the GDP value of some developing countries. The rapid changes in technology require not only energy resources and raw materials supply but also semiconductors and rare earth elements, which have changed the entire strategy of economic policies.

The two-digit economic growth in China encouraged the birth of the Made in China strategy which has been the cornerstone of its rapid economic expansion worldwide and has contributed to the accelerated change of the international economic order (Made-in-China, 2023).

The key force of the transition from a unipolar to a multipolar world consists in the innovation process. The transition began when the Liberal Order ended and we might define the transition period as a temporary global disorder as a new phase of world order where competition for technology supremacy is stronger than ever. Like England in the XIX century and the USA in the XX century as the principal engine of the liberal order created after the Second World War, now China exercises increasing global dominance by entailing control of the seas and sea lanes through several decisions like increasing dominance on the global rare earth value chains, and the growing trend in Artificial intelligence investments. Since 2020 China has become the EU's most important trading partner for goods by overtaking the U.S. trade position. The South China Sea is the place (of 3.5 million km²) where about 70% of the world's container traffic and 50% of the flows of hydrocarbons and liquefied natural gas transit.

In the US, the loss of technological progress compared to China has been driven by a lack of industrial policy. The main question for U.S. policymakers is not whether China will continue to advance relative to the United States when it comes to innovation and advanced production but whether US policymakers will include measures for U.S. economic and technology policy (Ian Clay, Robert D. Atkinson, 2023).

On the foreign policy strategy and according to the Trump administration decision a newly United States-Mexico-Canada Agreement (USMCA) was approved in 2020 to update NAFTA. The main target of U.S. was diminishing its trade deficits, protecting factories from bankruptcies, and protecting jobs (Office of the United States Trade Representative, n.d.).

NAFTA^[1] renegotiation has allowed the USA the right to opt-out if its partners would sign trade agreements with non-free market economies. Supporting a 21st Century economy through new protections for U.S. intellectual property, and ensuring opportunities for trade in U.S. services. New agreement chapters covering Digital Trade, Anticorruption, and Good Regulatory Practices, as well as a chapter devoted to ensuring that Small and Medium Sized Enterprises benefit from the Agreement (Office of the United States Trade Representative, n.d.).

The U.S. reason to reformulate NAFTA agreement was also to halt China's technological rise by tightening restrictions on exports, limiting Chinese takeovers of high-tech companies, and restricting visas for Chinese students studying in high-tech areas.

In the U.S., the loss of technological progress compared to China has been driven by a lack of industrial policy (Cleveland, Triolo, Simon, 2022).

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NAFTA renegotiation has allowed the USA the right to opt-out if its partners would sign trade agreements with non-free market economies. Among its key goals are: supporting a 21st Century economy through new protections for U.S. intellectual property, and ensuring opportunities for trade in U.S. services. New arrangement parts cover Digital Trade, Anticorruption, and Good Regulatory Practices, as well as a chapter dedicated to warranting that Small and Medium Sized Enterprises benefit from the Treaty (Office of the United States Trade Representative, n.d.).

In the global context, it is important to observe the EU's position in the world under the pressures of major challenges regarding its competitiveness and its position in the global economy.

What solutions does the EU have for strengthening integration in the current global reconfiguration? In the large variety of challenges, we depict the most important factors affecting the EU's competitiveness: the EU's demand for base metals, battery materials, and rare earth elements. This is set to increase exponentially as the EU substantially diminishes fossil fuels and encourages green energy systems.

In large part the reason for this hurtful situation is given by the Chinese firms that have expanded their merger and acquisition activity in the EU countries. The rising competition with China has determined German policymakers to recommend progresses to EU merger and acquisition legislation to stimulate the growth of European firms in order to be able to compete with their US and Chinese rivals.

4. What solutions does the EU have for strengthening integration in the current global reconfiguration?

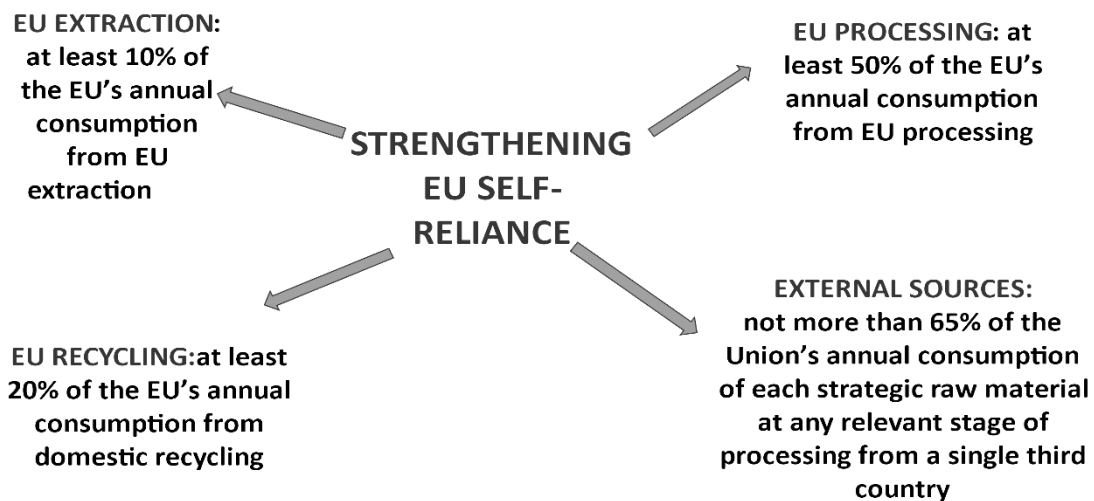
The Single Market has advantages in the field of research and development, regarding the supply of advanced materials in the segment of the manufacturing of the necessary equipment for chips production (European Commission, 2023a). The EU Single Market can give a new impetus to the development of the community space. In the EU countries there are over 50 production capacities for microprocessors, but almost all have been under the U.S. technology (European Commission, 2023a). For certain critical raw materials, the EU is merely reliant on one certain country, i.e. China delivers the main proportion of the EU’s supply of heavy rare earth elements (Gallium 71%, Germanium 45%, magnesium 97%, bismuth 65%), Turkey provides 98% of the EU’s supply of boron, and South Africa provides 71% of the EU’s needs for platinum.

The EU’s high dependency on China triggered an increasing risk of supply disruption in the form of affordable substitutes and a concentration of sources determined the European Commission to take a first step by adopting the European Critical Raw Materials (CRM) Act in June 2023. This first step opened the door for the new EU economic security strategy by increasing and diversifying the EU’s critical raw materials supply, strengthening circularity, including recycling, and financing EU research and innovation based on resource efficiency and the development of different substitutes. According to the proposal, the European Union should extract 10%, recycle 15%, and process 40% of its annual needs by 2030 for 16 "strategic raw materials" (European Council for an Energy Efficient Economy, 2023).

The Nederland already has curbed the export of advanced chip equipment but soon we saw Beijing's imposition of controls on the supply of germanium and gallium. All these latest punitive measures aren’t good signs for the process of world trade liberalization.

Some official points of view support a further improvement of EU legislation to secure the supply of critical raw materials own extraction, processing, and recycling capacities as well as more reliable trade with other countries (Ragonnaud, 2023).

Figure 4: The main directions for strengthening EU self-reliance



Source: Figure elaborated by the author based on the EU’s official data, European Commission (2023b).

5. Conclusion

The EU is in a process of adopting and implementing bold economic policies and strategies, starting from its new industrial strategy (European Commission, 2020). Demand for rare earths is expected to increase exponentially in the coming years. China has acquired ownership of key innovative technologies that potentially could weaken European security in terms of CRM supply. The EU is at the core of the U.S. – China trade tensions

and has been advised by the U.S. to reduce its dependence on Beijing, particularly in the area of technology infrastructure (Thomas J. Christensen, 2011)

In early 2020 the U.S. prevented European countries from awarding contracts for the new 5G network to the Chinese company Huawei (Robin Emmott, 2020). The Russian war against Ukraine has reinforced the cooperation between the EU and the United States (Desmots, 2023).

A dedicated policy and financial support in the EU for gaining an autonomous position of an innovative leader - The European Critical Raw Materials Act (European Commission, 2023c, European Parliament, 2023) signifies an important step in the direction of de-risking from China.

In the present context of diminishing financial contributions to the EU budget, a good solution for ensuring a gradually growing supply independence of semiconductors, different raw materials, and rare earth is to find extra money by issuing European bonds. This extra money could be used to implement a strategic plan to find new extraction of ores and build semiconductor plants in the European Member States.

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Spatial Dynamics of Regional Competitiveness in Central and Eastern Europe

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Abstract: Our study examines the territorial structure of 11 Central and Eastern European (CEE) Member States of the EU in NUTS 2 regional breakdown, considering the regional competitiveness as of the situation over the last couple of years. We focus our research on the question whether the regional competitiveness scores of the CEE regions are spatially auto-correlated. Then, we further analyze the determinants of the existing spatial concentrations. Methodologically, we apply quantitative analyses, including descriptive statistics and data visualization, as well as standard and spatial regression modeling. Our results confirm that the spatial neighborhood effect has a significant explanatory power for the regional competitiveness in CEE. Besides that, developing the high technology and knowledge intensive sectors, together with fostering social integration and inclusion, are crucial for improving the competitiveness of the CEE regions.

Keywords: Central and Eastern Europe, Regional Competitiveness, Spatial Development

JEL Classification: C21, C31, N94, R11, R12

1. Introduction

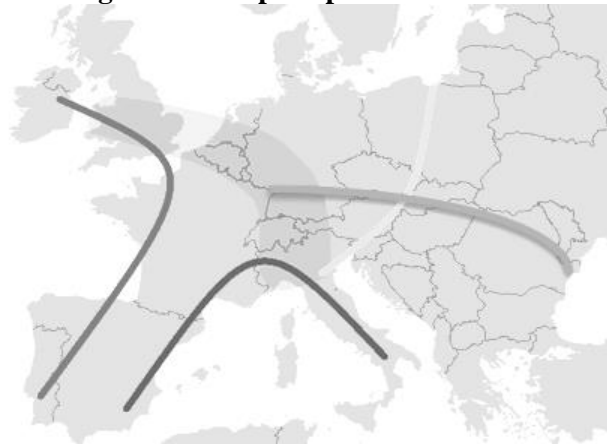
The objective of this study is to provide an empirical analysis on the spatial structure of Central and Eastern Europe (CEE) in terms of the regional competitiveness in a NUTS2 regional breakdown. Our analysis endeavors to explore spatial concentrations and exceptions based on insights gleaned from the latest EU Regional Competitiveness Index (RCI) report and dataset.

The spatial structure of Europe, revealed through economic regions like the 'Blue Banana,' traditionally linked London to Milan, symbolizing Europe's economic center (Brunet, 1989). However, recent recognition of potential growth areas like the 'Yellow Banana' and 'Sunbelt' suggests evolving economic poles alongside or beyond the Blue Banana (Hospers, 2003; Miljković; 2018; Capoani et al, 2023). In Figure 1, five key European economic regions are depicted: the Blue Banana in blue, the Latin Arch in red, the Atlantic Arch in purple, the Rhine-Danube corridor in orange and the Adriatic-Baltic Corridor in yellow. Besides analyzing the RCI, we also aim to evaluate the current significance and competitive dynamics entrenched within the strategic transport networks of the Rhine-Danube Corridor and the Baltic-Adriatic Corridor. These corridors' establishment has been instrumental in fostering economic interlinkages, enhancing social connectivity, and bolstering infrastructural advancements, cementing their pivotal roles within CEE (Peijis, 2020; Jensen, 2020).

The Baltic-Adriatic Corridor and the Rhine-Danube Corridor are respectively the first and the latest project of the new core Trans-European Transport Network (TEN-T) that were originally announced on the 17th October 2013 to support the development of the core EU infrastructure policy (European Commission, 2013). By connecting at least three Member States through three transportation modes with no less than two cross-border sections, each corridor constitutes the beating heart of a truly internal market that grants free movement of people and goods. As such, both the Baltic-Adriatic Corridor and the Rhine-Danube Corridor are conceptualized and built via robust infrastructural capabilities and intricate transportation networks supporting the expansive industrial presence (European Commission, 2013). Their infrastructural prowess not only underpins their

fundamental roles in trade facilitation but also earmarks these corridors as critical hubs for economic development, fostering regional prosperity while promoting connectivity (Czech, 2021).

Figure 1: Europe's spatial structure



Source: Authors based on literature

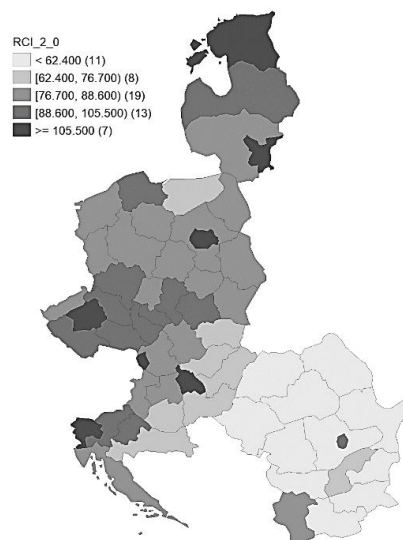
In the next section, we focus our research on the question whether the regional competitiveness scores of the CEE regions are spatially auto-correlated. Then, we further analyze the determinants of the existing spatial concentrations.

2. Standard and regional correlates of the regional competitiveness in CEE in 2022

To provide a comprehensive picture about the landscape of regional competitiveness in CEE, we apply quantitative analysis methods, including descriptive statistics and data visualization, as well as standard and spatial regression modeling. The outcome variable is the revised version of the EU Regional Competitiveness Index (RCI 2.0) for the year 2022. Dijkstra and coauthors (2023) give a detailed description about conceptual framework and calculation of the RCI. Although the latest scores are calculated for 2022, data for many of the pillar variables originate from 2019 in order to avoid the biased effect of the pandemic situation. Appendix 1 shows the RCI 2.0 framework structure.

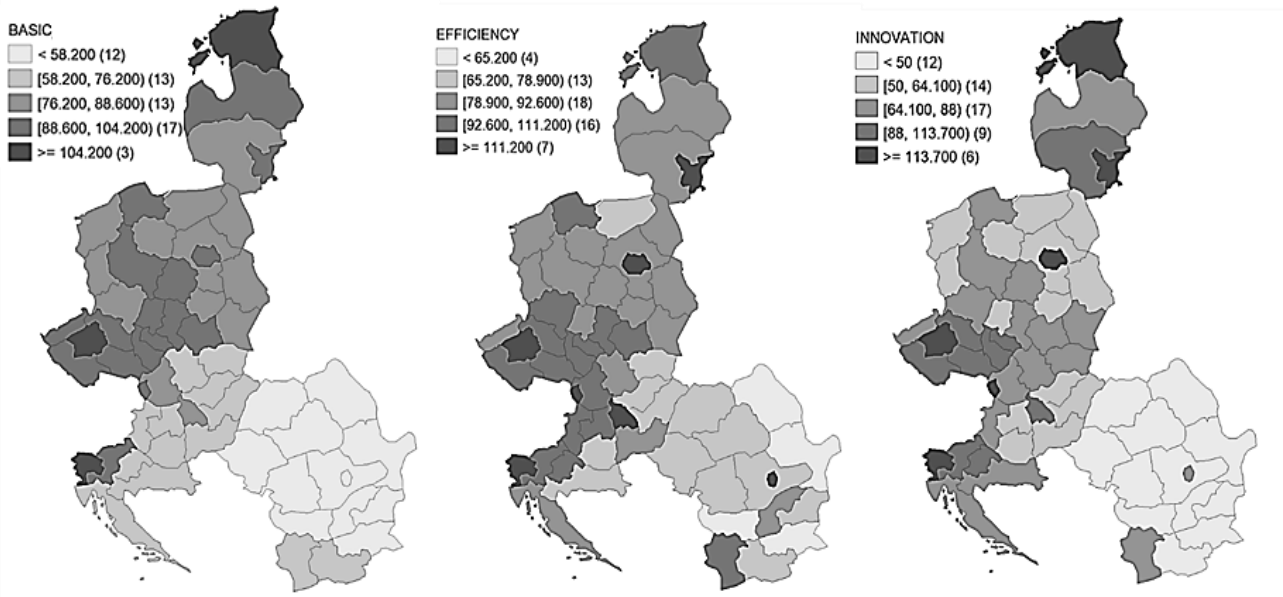
The analyzed territories are the NUTS2 regions of 11 CEE countries, which are Bulgaria, the Czech Republic, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. Looking at the RCI 2.0 map of the CEE regions in 2022 (Figure 2), we see that the Bulgarian and Romanian regions, apart from the capitals, are the lowest scored regions. On the other hand, the Baltic countries, the Czech Republic and Slovenia consist exclusively of relatively high-scored regions. In general, the capital regions have the highest scores in each country. Looking at the three sub-indices of the RCI (Figure 3), we get similar patterns of regional scores overall with some slight differences.

Figure 2: NUTS2 regions of the 11 CEE countries according to the RCI



Source: Authors based on data published by the European Commission (2023)

Figure 3: NUTS2 regions of the 11 CEE countries according to the three sub-indices of the RCI



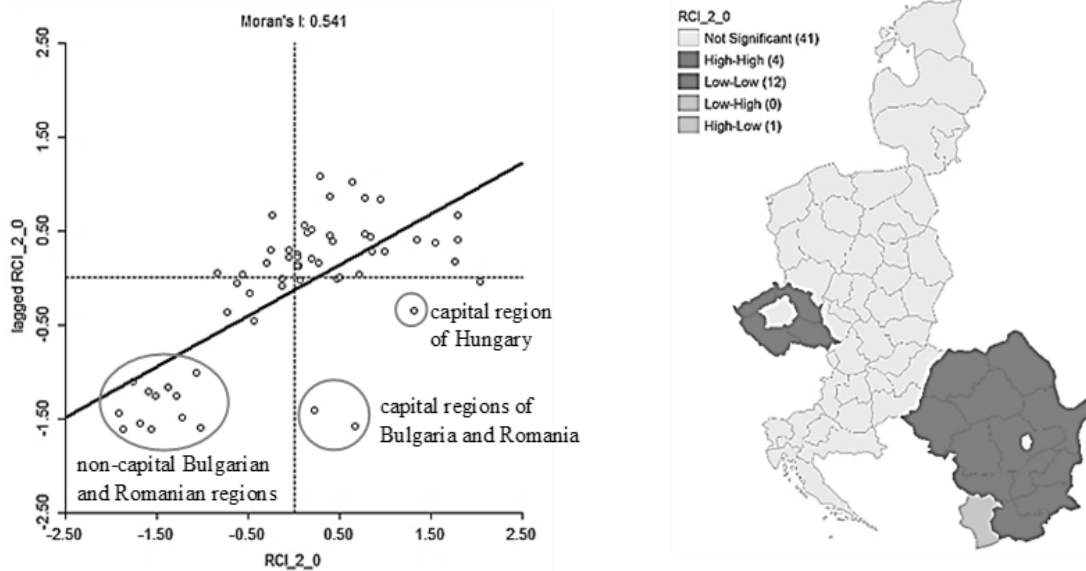
Source: Authors based on data published by the European Commission (2023)

The socioeconomic landscape of CEE according to the RCI and its sub-indices reflects the spatial role of the so-called Baltic-Adriatic Corridor; those regions that are within or nearby this corridor have higher scores while the more distant southeastern regions have the lowest scores. In this context, it is essential to emphasize that the Baltic-Adriatic Corridor, facilitating efficient movement between the Baltic and Adriatic Seas, stands as a crucial transport link for goods and people. This network significantly contributes to the economic development of the involved regions and plays a pivotal role in fostering economic growth and infrastructural integration (Schuschnig, 2015; Jensen, 2020).

Regarding the Baltic-Adriatic Corridor, based on the RCI scores, there is potential for its extension northward to the Baltic countries, not limited solely to the Polish coastal area. Similarly, the Rhine-Danube Corridor, stretching eastwards through Hungary, Romania, and Bulgaria to the Black Sea, is another vital transport route. This corridor, too, facilitates the seamless transportation of goods, bolstering economic ties and infrastructural connectivity in the Eastern European regions it traverses. Together, these corridors form crucial links in advancing economic development and promoting greater integration within Europe's transport infrastructure (Sava, 1997; Peijis, 2020). In order to improve the situation in the Balkan area too, widening the Baltic-Adriatic Corridor into a Baltic-Adriatic-Balkan Triangle would be expedient. Based on the spatial effect, we suppose that improving the infrastructural connectivity with the southeastern parts would be beneficial for CEE as whole. International scholars suggest that infrastructural policies are moving towards a much greater connectivity between the EU and the CEE in support of further EU integration (Przygoda, 2017; Meka, 2016; Bruszt et al., 2020). Indeed, the *Western Balkan Summit* (2015) triggered a deeper regional integration in Central Eastern Europe. After two years it occurred the signature of a *Transport Community Treaty* (2017) to improve the efficiency of the logistical network and to deliver transportation modes of greater quality – all while favoring the path of EU political integration of the entire Balkan region.

Moran's I test, run on neighborhood-based spatial weight matrix, demonstrates a significant overall spatial autocorrelation (Figure 4). Besides, the local Moran's I test shows a high-scored territorial concentration among the Czech regions and a low-scored concentration among the (non-capital) Bulgarian and Romanian regions. Looking at the scatter-plot, the non-capital Bulgarian and Romanian regions are remote from the rest of the regions. Furthermore, the capital regions of these two countries are spatial exceptions; while they have higher RCI scores than the standardized mean value, their neighbors have low scores, resulting in a large distance from the regression line on the scatter plot. In this regard, the Hungarian and Polish capital regions are also spatial exceptions, although to a less significant extent. Moreover, the capital region of Poland has the highest RCI score among all of the examined regions.

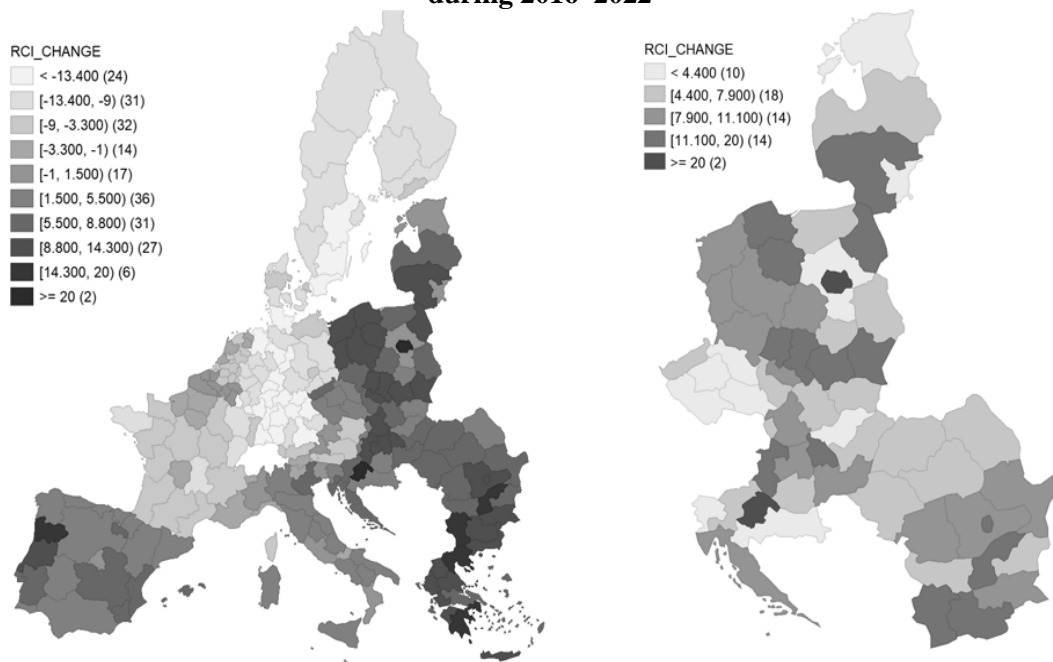
Figure 4: Global (left) and local (right) Moran's I tests on the spatial autocorrelation of the RCI among the CEE regions



Source: Authors based on data published by the European Commission (2023)

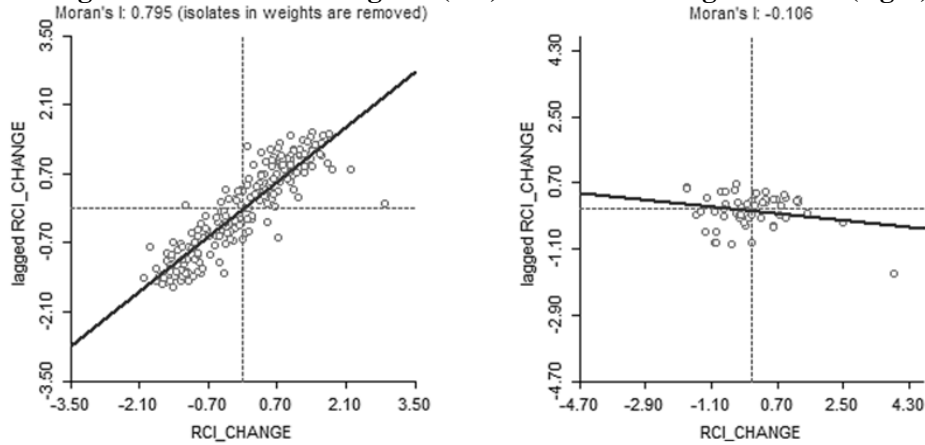
When we consider the RCI change between 2016 and 2022, we get a particular picture in the CEE context, compared to the EU as a whole. The regions of the Mediterranean and CEE area could improve their scores more than the most developed Western European and Scandinavian regions over the period (Dijkstra et al., 2023), which is visible on the map of Figure 5. However, considering only CEE, the change in scores is spatially fragmented, despite that all of these regions improved their RCI. The global spatial autocorrelation tests confirm this finding (Figure 6); there is a strong and significant spatial autocorrelation in terms of the RCI change between 2016–2022 within the whole continental area of the EU, while the same variable is spatially un-auto correlated when we consider CEE alone. It is worth comparing this result with the findings of Egri and Táncoz (2018); analyzing the convergence in the CEE regions in terms of GDP per capita and Human Development Index (HDI) between 2004–2014, the authors find convergence between the less and the more developed regions, as well as a significant spatial neighborhood effect. Nevertheless, the authors also involve the Austrian and German NUTS2 region into their analysis while they do not consider the three Baltic countries and Croatia.

Figure 5: NUTS 2 regions of the EU (without Ireland) (left) and CEE (right) according to the RCI change during 2016–2022



Source: Authors based on data published by the European Commission (2023)

Figure 6: Global Moran’s I test on the spatial autocorrelation of the RCI change between 2016–2022 among the continental EU regions (left) and the CEE regions alone (right)



Source: Authors based on data published by the European Commission (2023)

Next, we examine the determinants of the RCI scores of the CEE regions in 2022 with standard and spatial regressions. Table 1 summarizes the explanatory variables for the modeling.

Table 1: Independent variables included in the regression model

Variable	Year	Information	Source
Population	latest available	capita	Eurostat
GDP per capita	2020	in PPS, expressed as index (EU27=100)	Eurostat
Unemployment rate	2019	percentage	Eurostat
Employment in high tech. and knowledge-intensive sectors	2019	percentage of total employment in the NUTS 2 European regions	Eurostat
Female Achievement Index	2019-2020 (latest available)	expressed on a 100-point scale	Norlén et al. (2021)
NEET rate	2019–2021 (average)	share of young people (aged 15–29) not in education, employment or training; percentage	Eurostat and DG Regional and Urban Policy
Capital region	-	dummy variable	own

Source: Own editing.

Population is included in the model as a control variable. Regional GDP per capita and unemployment rate, as explanatory variables, are conventionally used indicators of formal socioeconomic performance. However, the employment rate in high technology and knowledge-intensive sectors (as the percentage of total employment) may provide a more sophisticated picture about competitiveness, therefore we use it as another independent variable. Further explanatory variables are the Female Achievement Index (FAI), showing the social integration of women as a composite index, and the ratio of non-integrated young population (aged 15–29) who are neither in employment nor in education and training (NEET). These two sociodemographic indicators are included for the suggestion of Dijkstra and coauthors (2023). Finally, as a dummy (i.e. binary categorical) independent variable, we use capital region too.

According to the results of the standard regression model (Table 2), GDP per capita, unemployment rate, NEET rate and the social integration of women influence significantly the regional competitiveness scores. Based on the diagnostics of spatial dependence (Table 3), spatial autocorrelation is significant in form of spatial lag, which suggest that the spatial model can provide a better explanation than the standard model. Therefore, we repeat our regression accordingly as a spatial lag model (Table 4). GDP per capita, NEET rate and FAI remained significant while the unemployment rate has no significant impact in the spatial model. On the other hand, the employment rate in high technology and knowledge-intensive sectors has a significant impact, as well as the category of capital regions. (Appendix 2 and 3 show the detailed software output of the regression models.)

Table 2: Standard regression model on the RCI 2022

Population	1.3279e-06 (1.15148e-06)
GDP per capita	0.1631* (0.0625925)
Unemployment	1.44607* (0.57351)
Employment in high-tech sectors	0.845736 (0.697317)
NEET	-1.47286*** (0.28342)
FAI	0.990315*** (0.149409)
Capital region	3.31624 (3.75367)
Constant	27.0675*** (9.78195)

* $p \leq 0,05$; ** $p < 0,01$; *** $p < 0,001$

Source: Authors' computation

Table 3: Diagnostics for spatial dependence

	Value	Probability
Lagrange Multiplier (lag)	18.6188	0.00002
Robust LM (lag)	12.6735	0.00037
Lagrange Multiplier (error)	6.1553	0.01310
Robust LM (error)	0.2099	0.64681

Source: Authors' computation

Table 4: ML spatial lag model on the RCI 2022

Population	1.58537e-06 (8.65227e-07)
GDP per capita	0.155619*** (0.0469)
Unemployment	0.709735 (0.434791)
Employment in high-tech sectors	1.17795* (0.522435)
NEET	-0.856745*** (0.225877)
FAI	0.625367*** (0.13015)
Capital region	5.62392* (2.85913)
Spatial lag	0.379087*** (0.0646737)
Constant	9.04837 (7.81119)

* $p \leq 0,05$; ** $p < 0,01$; *** $p < 0,001$

Source: Authors' computation

Overall, the spatial regression analyses confirms that the neighborhood effect has a significant explanatory power for the regional competitiveness. Traditional economic indicators, such as regional GDP per capita, still matter in the CEE context. However, when taking into account the spatial effect, the employment rate in high technology and knowledge intensive sectors becomes significant instead of the indicator of mere

(un)employment. Capital regions become also significant in the regional model. These results altogether imply that, in order to improve the competitiveness of each CEE region, regional development policies should put the focus on developing the higher technology and more knowledge intensive sectors instead of relying on traditional industrial sectors, not only in the capital regions but in the lagged behind territories as well. Furthermore, fostering social integration and inclusion is also important.

3. Conclusion

Our study provided a comprehensive analysis of regional competitiveness among the NUTS2 regions of 11 Central and Eastern European countries. In terms of the Regional Competitiveness Index in 2022, the territorial structure of CEE is spatially auto-correlated. In general, the capital regions have the highest RCI scores, while the Baltic-Adriatic Corridor also has a significant spatial impact.

Given the evolving economic dynamics, our study underscores the pressing need for strategic interventions aimed at enhancing the competitiveness of CEE regions collectively. One of the most relevant findings of the study is the significant effect of spatial neighborhood on the regional competitiveness. In accordance with this finding, the main conclusion of our analysis is that, in order to counterweight Western European economic predominance, the CEE regions must improve their competitiveness as a whole, which implies the need for more effective regional development policies in the most deprived regions. These interventions should emphasize fostering innovation, boosting infrastructure, and implementing targeted policies to uplift the economic potential of the regions. Effectively addressing these disparities is pivotal for achieving a more balanced and competitive economic landscape across Central and Eastern Europe, as well as within the whole European Union.

Acknowledgement

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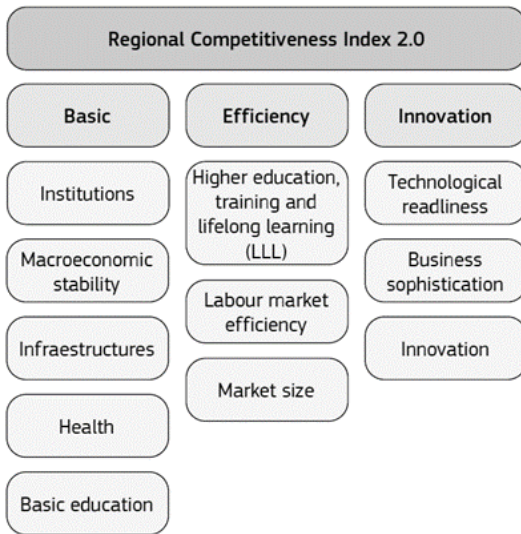
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Appendix 1: RCI 2.0 framework structure by Dijkstra and coauthors (2023)



Appendix 2: Standard linear regression model on the RCI 2022 (GeoDa software output)

Variable	Coefficient	Std. error	t-Statistics	Probability
Population	1.3279e-06	1.15148e-06	1.15321	0.25431
GDP/cap	0.1631	0.0625925	2.60575	0.01205
Unemployment	1.44607	0.57351	2.52144	0.01492
Employment in high-tech sectors	0.845736	0.697317	1.21284	0.23089
NEET	-1.47286	0.28342	-5.19674	0.00000
FAI	0.990315	0.149409	6.62821	0.00000
Capital region	3.31624	3.75367	0.883466	0.38121
Constant	27.0675	9.78195	2.76709	0.00791
<i>Diagnostics for spatial dependence</i>		<i>Value</i>	<i>Probability</i>	
Lagrange Multiplier (lag)		18.6188	0.00002	
Robust LM (lag)		12.6735	0.00037	
Lagrange Multiplier (error)		6.1553	0.01310	
Robust LM (error)		0.2099	0.64681	

Mean dependent var :	81.2879
S.D. dependent var :	18.216
R-squared :	0.903566
Adjusted R-squared :	0.890066
Sum squared residual:	1855.94
Sigma-square :	37.1187
S.E. of regression :	6.09252
Sigma-square ML :	31.9989
S.E of regression ML:	5.65676
Number of Observations:	58
Number of Variables :	8
Degrees of Freedom :	50
F-statistic :	66.9273
Prob(F-statistic) :	3.51946e-23
Log likelihood :	-182.804
Akaike info criterion :	381.608
Schwarz criterion :	398.091

Appendix 3: ML spatial lag model on the RCI 2022 (GeoDa software output)

<i>Variable</i>	<i>Coefficient</i>	<i>Std. error</i>	<i>z-value</i>	<i>Probability</i>	
Population	1.58537e-06	8.65227e-07	1.83232	0.06690	Mean dependent var : 81.2879 S.D. dependent var : 18.216 Lag coeff. (Rho) : 0.379087
<u>GDP/cap</u>	0.155619	0.0469	3.3181	0.00091	R-squared : 0.937312 Sq. Correlation : - Sigma-square : 20.8014 S.E of regression : 4.56086
Unemployment	0.709735	0.434791	1.63236	0.10260	
<u>Employment in high-tech sectors</u>	1.17795	0.522435	2.25474	0.02415	Number of Observations: 58 Number of Variables : 9 Degrees of Freedom : 49
<u>NEET</u>	-0.856745	0.225877	-3.79298	0.00015	
<u>FAI</u>	0.625367	0.130153	4.80488	0.00000	Log likelihood : -171.403 Akaike info criterion : 360.806 Schwarz criterion : 379.35
<u>Capital region</u>	5.62392	2.85913	1.967	0.04918	
<u>Spatial lag</u>	0.379087	0.0646737	5.86154	0.00000	
Constant	9.04837	7.81119	1.15839	0.24671	

Comparative Analysis of Leading Sectors in Bulgaria, Hungary and Romania

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Abstract: The Coronavirus pandemic marked the end of an era in the catching-up process of East-Central Europe. A thorough evaluation of the growth model of the last decade is therefore needed in order to draw lessons for future industrial policy. The aim of this article is to provide a comparative analysis of the Bulgarian, Hungarian and Romanian growth models based on the examination of leading sectors. The paper compares the five leading sectors of the three countries in the period 2011-2018. The five leading industries are defined in terms of their contribution to gross value-added growth. The paper also examines foreign dependence and labour productivity growth in the leading sectors, the latter also being key to analysing the possibility of a middle-income trap. The results show a different sectoral specialisation in the three countries. The foreign dominance is higher in Hungary and Romania. Moreover, Romania is the best performer in terms of labour productivity.

Key-words: growth models, leading sectors, catching-up, middle-income trap, dependency, industrial policy

JEL Classification: O14, O52, P52

1 Introduction

In recent years, the COVID-19 pandemic, the climate crisis and the Russian-Ukrainian war have led to a structural transformation in the European and global division of labour. This transformation has valued the use of new state instruments (Ricz, 2023) which have contributed to the global revival of industrial policy. This process has also affected East-Central Europe which has experienced a relatively successful growth period in the 2010s (Rapacki, & Prochniak, 2019). Regional governments have been forced to implement industrial policies to maintain the growth trajectory and to manage the structural transformation in the economy (Szabó, 2023). However, in order to build a successful industrial strategy that can form the basis for convergence in the current decade, it is important to have a deep understanding of our growth model in the last decade. Moreover, it is also important to have a look at the existing sectoral structure of our economies to identify the main trends and opportunities. Therefore, in order to distil some lessons for our future industrial policy, this paper aims to analyse and compare the growth models of three East-Central European countries, Bulgaria, Hungary and Romania, by analysing the five leading sectors between 2011 and 2018.

Due to the comparative nature of the study, the theoretical framework is provided by comparative capitalism (see for instance: Schedelik, Nölke, Mertens & May, 2021). Within this, the paper builds on the latest growth model literature, which has launched a new research agenda in the last decade (Baccaro & Pontusson, 2016; Stockhammer, 2016). The growth model literature has focused on the demand side of the economy on a post-Keynesian basis. This paper argues that it is also worthwhile to analyse the sectors that drive growth, adding a supply-side element to the growth model approach. Thus, this paper not only provides interesting insights for a future industrial policy, but also complements the growth model literature. The research uses Eurostat data to identify the five sectors that account for the largest share of gross value-added growth between 2011 and 2018. The paper refers to these as leading sectors.

The paper also explores two important theoretical concepts in relation to the leading sectors. The first is dependency, which is often associated with regional growth models. Authors contributing to the literature on comparative capitalism interpret the region as a kind of dependent market economy in which the role of foreign capital is prominent (Nölke & Vliegenthart, 2009; Bohle, 2018). Second, we draw on the concept of the middle-income trap, as a number of studies analyse East-Central Europe from this perspective (Myant, 2018; Csath, 2022; Györffy, 2022). The middle-income trap is one of the main challenges threatening the success of growth models in the region. Studies confirm that one of the key issues in avoiding the middle-income trap is productivity

growth (Kharas & Kohli, 2011; Györffy, 2021). The sectoral analysis, therefore, looks at foreign dominance and labour productivity growth in the leading sectors.

Overall, the study seeks to answer three questions. 1. What were the leading sectors in Bulgaria, Hungary and Romania in the period 2011–2018? What were the similarities and differences? 2. Which leading sectors were dominated by foreign value added? 3. What was the trend in labour productivity in the leading sectors? The study consists of four parts. The first part presents the theoretical background. The second part describes the methodology. This is followed by a description of the results. The paper ends with the conclusions.

2 Theoretical background

2.1 The growth model approach in comparative capitalism

Traditionally, the flagship approach to comparative capitalism has been the varieties of capitalism (VoC) approach developed by Hall and Soskice (2001). In their edited volume, the authors distinguished between two varieties of capitalism in developed countries: coordinated and liberal market economies. This influential analysis has been followed by a number of exciting studies that have further extended the territorial and theoretical scope of VoC (Hall, & Thelen, 2009; Nölke, 2018; Feldmann, 2019).

In the 2010s, however, a new approach to comparative capitalism emerged: the growth model literature. Growth model scholars criticised the VoC for its lack of dynamism and neglect of the demand side of the economy (Schedelik et al., 2021). They, therefore, developed a new theoretical approach to comparing capitalist economies based on post-Keynesian macroeconomics. The growth model scholars focus on the demand drivers of growth, and on this basis, they distinguish different growth models. For instance, Baccaro and Pontusson (2016) identify a credit-driven consumption-led model in the UK, an export-led German model and a balanced model in Sweden which is based on both exports and consumption. In contrast, Stockhammer (2016) defines only two types: an export-led model in Germany, Northern Europe, China and Japan, and a debt-driven model in the Anglo-Saxon and Southern European countries.

The literature on growth models focuses on the drivers of growth. Nevertheless, this post-Keynesian approach deals only with the demand side of growth. The paper argues that it may be worthwhile to complement the current line of research with a sectoral analysis, i.e. it is also necessary to examine which sectors contribute most to growth in a given period. The study will focus on this sectoral approach in order to analyse growth models from a new angle.

2.2 The East-Central European growth model

East-Central Europe has often been analysed in the literature on comparative capitalism. There are many slightly different interpretations of the regional growth model. Nölke and Vliegenthart (2009) identify the region, especially the V4 countries, as a new model of capitalism, the dependent market economy, and they draw the attention to the importance of FDI in determining the institutional structure. Drahokoupil (2009) uses the term competition state to describe the regional model as countries competing for foreign capital. Bohle (2018) identifies an export-driven dependent model, which is most relevant for the Visegrad Four. A slightly different approach is taken by Ban and Adascalitei (2022). They find the existence of an export-led dependent growth model. However, they also confirm that debt-driven consumption has been an important element, especially in the Baltic countries and in countries with a larger domestic market (Romania and Poland). Furthermore, Ban (2019) highlights the resilience of Romania's dependent model after the 2008 crisis.

Aside from conceptual differences, these analyses point in the same direction. Based on them, we can describe the regional growth model as an export-led dependent model. Dependence refers to the importance of foreign sources (Bohle, 2018), especially the crucial role of foreign direct investments. It means not only that the growth in the region is fuelled by foreign sources, but also that the institutional structure is subordinated to the interests of foreign capital (Nölke and Vliegenthart, 2009). The regional governments try to attract more and more FDI and they shape the labour market institutions, the tax system and the wage growth to achieve this goal. As a result, the regional countries are engaged in a competition to provide the most favourable environment for FDI (Drahokoupil, 2009). The key problem with this competition is that the main competitive advantages of the region are low wages and low-costs (Györffy, 2022). The result is that FDI inflows to the region are mainly low value-added (Éltető & Medve-Bálint, 2023; Fülöp, 2023).

The dependent catch-up model with this harmful competition creates an unfavourable structural position in the global value chains (GVC). Based on the smile curve, which captures the organisation of the GVCs (Mudambi, 2008), the regional economies specialise in the middle of the value chain, i.e. in manufacturing activities (Stöllinger, 2021). However, these manufacturing activities have a lower value added than the activities

at the two ends of the value chain which creates a trap situation for the regional economies (Stöllinger, 2021). Therefore, the region is a “factory economy” in Europe, while the headquarters are located in the western countries, especially Germany (Kordalska & Olczyk, 2023). From a sectoral point of view, it means an overdominance of manufacturing industries. In particular, the automotive sector plays an important role, but the region still has a semi-peripheral position in this value chain (Gáspár, Sass, Vlčková, & Koppány, 2023).

Based on this interpretation, it is not surprising that many scholars draw attention to a possible middle-income trap in the context of the regional growth model. As Kharas and Kohli (2011) point out, the essence of middle-income trap is to get stuck in resource-based growth without switching to productivity growth. In the region, the middle-income trap implies the fading away of the potential for growth based low value-added foreign resources. Myant (2018), for example, argues that the region's dependent market economy model is clearly exposed to the middle-income trap because it is built on low-wages. In addition, Barbu (2016) highlights that the Romanian growth model does not have the necessary ingredients to avoid the middle-income trap. Finally, Csath (2022) concludes that Hungary is lagging behind in development indicators and is therefore at a risk of falling into the middle-development trap. Overall, it is important to examine the extent to which the region's model is exposed to the risk of the middle-income trap and according to Kharas and Kohli (2011) one of the most important indicators for this is productivity growth.

In line with the literature on growth models, we can formulate some expectations for analysis of leading sectors. First, it is reasonable to assume that manufacturing will dominate the leading sectors and that the automotive industry will be present. Second, we can expect the dependence to be strongest in the case of Hungary compared to Romania and Bulgaria as the literature on growth models mostly puts the V4 countries in this dependent category (Nölke & Vliegthart, 2009).

3 Methodology

The research identified sectors according to Eurostat's NACE classification of economic activities, starting from 21 economic activities, but breaking down the manufacturing sector into 13 industries. A combined analysis of manufacturing sector would have been highly misleading and would not have captured the significant differences between the manufacture of transport equipment or the food industry. In addition, we have also split up the wholesale and retail trade and the repair of motor vehicles, as it is appropriate to consider separately the wholesale and retail trade, which are large and important sectors. Thus, a total of 35 activities were examined (see Table 1).

For the comparative analysis, we collected the gross value added of the 35 sectors in Bulgaria, Hungary and Romania for the years 2011 and 2018. The necessary data were provided by Eurostat's detailed database of national accounts (Eurostat, 2021). The five leading sectors were those that contributed most to the growth of gross value added over the period considered, i.e. their contribution to the value-added growth (CVAG) was the highest. To determine this, we calculated the growth of the gross value added for the economy as a whole and for each sector over the period (we used gross value-added data in millions of euros, indexed to 2010 prices – Eurostat, 2021). Expressed as a percentage, the indicator, called CVAG in the study, captures the share of a sector's value-added growth in the value-added growth of the whole economy. For example, if it is 50 per cent, this means that the value-added growth of that sector accounted for half of the value-added growth of the whole economy. The five sectors with the highest CVAG index became the leading sectors in each country.

$$\text{Contribution to value-added growth (CVAG)} = \frac{\text{Industry VA}_{2018} - \text{Industry VA}_{2011}}{\text{Total Economy VA}_{2018} - \text{Total economy VA}_{2011}} * 100$$

To answer further research questions, several indicators were calculated for the leading sectors. For dependency, the share of foreign value added in 2018 was calculated, and for the analysis of the middle-income trap, the level and growth of labour productivity were examined. Other indicators are presented in detail in Table 2.

Table 1: Examined sectors

Agriculture, forestry and fishing	Manufacture of machinery and equipment n.e.c.	Financial and insurance activities
Mining and quarrying	Manufacture of motor vehicles, trailers, semi-trailers and of other transport equipment	Real estate activities

Manufacture of food products; beverages and tobacco products	Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment	Professional, scientific and technical activities
Manufacture of textiles, wearing apparel, leather and related products	Electricity, gas, steam and air conditioning supply	Administrative and support service activities
Manufacture of wood, paper, printing and reproduction	Water supply; sewerage, waste management and remediation activities	Public administration and defence; compulsory social security
Manufacture of coke and refined petroleum products	Construction	Education
Manufacture of chemicals and chemical products	Wholesale and retail trade and repair of motor vehicles and motorcycles	Human health and social work activities
Manufacture of basic pharmaceutical products and pharmaceutical preparations	Wholesale trade, except of motor vehicles and motorcycles	Arts, entertainment and recreation
Manufacture of rubber and plastic products and other non-metallic mineral products	Retail trade, except of motor vehicles and motorcycles	Other service activities
Manufacture of basic metals and fabricated metal products, except machinery and equipment	Transportation and storage	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
Manufacture of computer, electronic and optical products	Accommodation and food service activities	Activities of extraterritorial organisations and bodies
Manufacture of electrical equipment	Information and communication	

Source: Author's elaboration.

Table 2: Examined variables

Variables	Description	Source
Labour productivity	gross value added per person employed in the sector	Eurostat (2021)
Labour productivity compared to the regional average (2018)	the labour productivity of the sector as a percentage of the average regional labour productivity of the sector The regional average is the average of 11 East-Central European countries (Csontos, 2023).	Eurostat (2021)
Labour productivity growth	the growth of gross value added per person employed in the sector	Eurostat (2021)
Foreign dominance (2018)	share of foreign firms in value added at factor cost in 2018 (current prices)	Eurostat (2022)
Labour productivity gap (2018)	Labour productivity of foreign firms as a share of labour productivity of domestic firms	Eurostat (2022)

Source: Author's elaboration

4 Results

The Table 3 shows the leading sectors in the three countries. The results point to the fact that, contrary to expectations, it was not the manufacturing sectors but the service-related sectors that dominated the leading industries. For example, the retail trade and the information and communication sector appeared in all the three countries. The presence of the former reinforces the importance of domestic consumption in the growth model proposed by Ban and Adascalitei (2022). Nevertheless, it is important to note that the role of retail trade was the most important in Romania where it explained the 21% of the value-added growth between 2011 and 2018, while in Bulgaria and Hungary the contribution was around 8%. The information and communication sector had a similar contribution of around 10-12% in the three countries. Real estate activities were both present in Romania and Bulgaria, with a contribution of 21% in Bulgaria and 9% in Romania. In Romania and Hungary, the manufacture of motor vehicles, trailers, semi-trailers and of other transport equipment was present with a contribution of 12% which supports the argument of the crucial role of the automotive sector (Gáspár et al., 2023). Nevertheless, this analysis has shown that this phenomenon is not limited to the V4 countries but also applies for Romania.

Apart from the similarities, there are significant differences between the three countries. In Bulgaria we can see the emergence of the accommodation and food service activities and wholesale and retail trade and repair of motor vehicles and motorcycles. The role of tourism therefore is much more important than in the other countries. In Hungary, the professional, scientific and technical activities and administrative and support services contributed 20% to the value-added growth over the period considered which shows the importance of soft services in the country. Soft services is a term used by Boda, Révész, Losonci and Fülöp (2019). They argue that the performance of hard service industries requires significant material networks (such as retail trade, information and communication), whereas for soft service industries the basic service is not material (such as scientific and technical activities). One reason for this result may be the growing importance of the administrative shared service centres (SSC-s) in the Hungarian model (Bucsky, 2021). In Romania, in addition to retail trade, transportation and storage made a high contribution (19%). Together these two sectors were accounted for the 40% of the value-added growth of the whole economy over the period, showing a less diversified economy than in Hungary or Bulgaria.

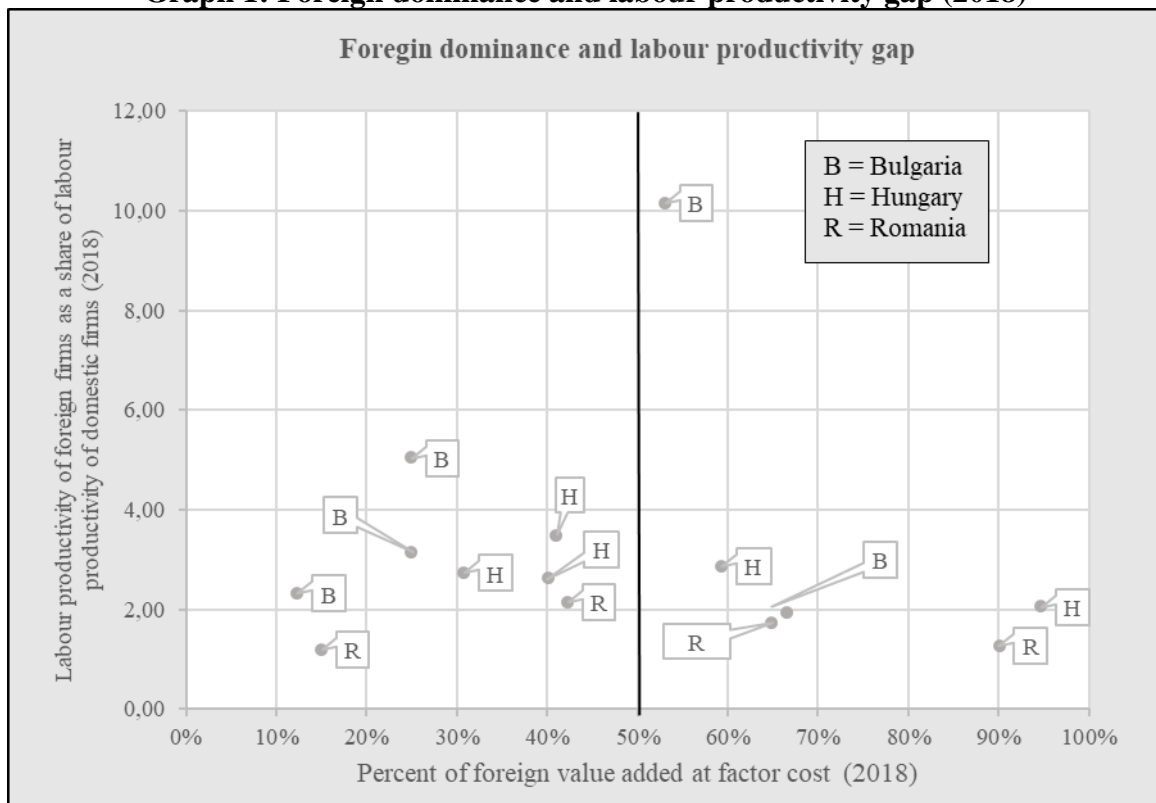
Table 2: Leading sectors in Bulgaria, Hungary and Romania between 2011-2018

Bulgaria	Contribution to value added growth	Hungary	Contribution to value added growth	Romania	Contribution to value added growth
Real estate activities	21%	Professional, scientific and technical activities	12%	Retail trade, except of motor vehicles and motorcycles	21%
Information and communication	12%	Manufacture of motor vehicles, trailers, semi-trailers and of other transport equipment	12%	Transportation and storage	19%
Accommodation and food service activities	11%	Information and communication	10%	Information and communication	12%
Wholesale and retail trade and repair of motor vehicles and motorcycles	9%	Administrative and support service activities	8%	Manufacture of motor vehicles, trailers, semi-trailers and of other transport equipment	12%
Retail trade, except of motor vehicles and motorcycles	8%	Retail trade, except of motor vehicles and motorcycles	8%	Real estate activities	9%

Source: Author's computations based on (Eurostat, 2021).

In the Graph 1, we can see the foreign dominance and the labour productivity gap between foreign and domestic firms in the leading sectors in 2018. Bulgaria is less foreign dominated, as 36.4% of the value added at factor cost in the leading industries is produced by foreign enterprises. The most foreign-dominated sector is the information and communication with 67%. Nevertheless, the labour productivity gap is large, with foreign enterprise being on average 4,5 times more productive than domestic firms. However, this is mainly due to the real estate activities, which is an outlier. If real estate activities are excluded, the number is lower, but it is still the highest among the three countries. Hungary and Romania have a higher foreign share, more than 53% on average. The most foreign-dominated sectors are information and communication with 59% (Hungary) and 65% (Romania) and manufacture of motor vehicles with 95% and 90%, respectively. This result reinforces the dependency argument put forward by Nölke and Vliegenthart (2009). The labour productivity gap is significantly lower in Romania (1,59), while in Hungary foreign firms are 2,74 times more productive than domestic firms in the averages of the leading sectors.

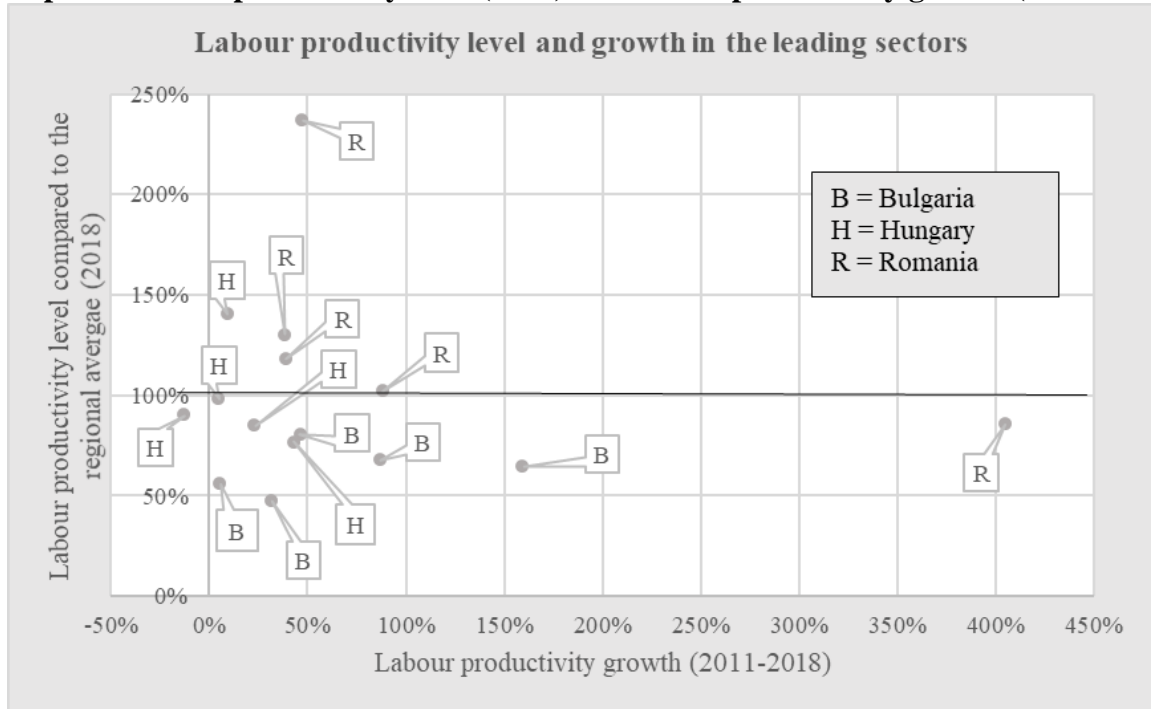
Graph 1: Foreign dominance and labour productivity gap (2018)



Note: Real estate activities was excluded in Romania due to the lack of data.
 Source: Author based on Eurostat (2022)

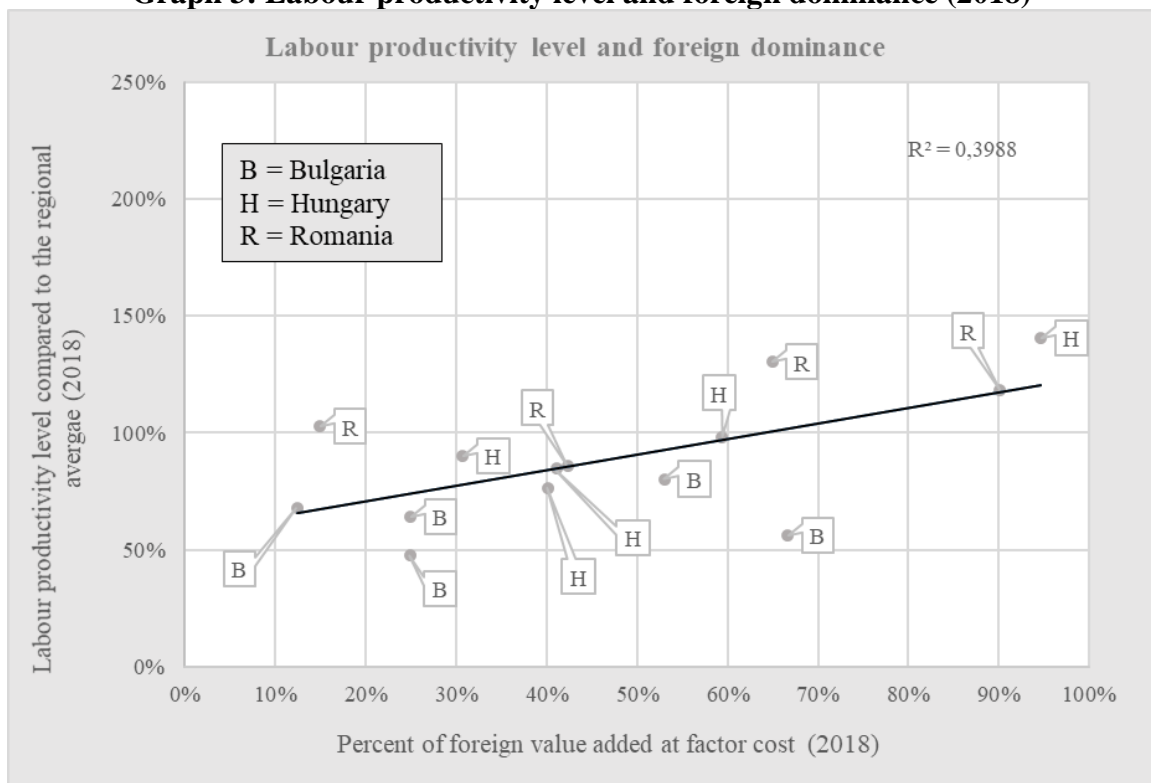
The Graph 2 depicts the results of the labour productivity analysis. In Bulgaria, the labour productivity growth in the leading sectors was impressive in the analysed period (66% on average). For instance, productivity in the wholesale and retail trade and repair of motor vehicles and motorcycles sector increased by 159%. However, the level of labour productivity in the leading sectors was well below compared to the regional average (63% on average). The regional average is the average level of labour productivity in the 11 countries of East-Central Europe (Csontos, 2023). Similarly, Hungary's leading sectors have a lower labour productivity level than the regional average (98%). Only the manufacture of motor vehicles, the most foreign-dominated sector, is above the average. Productivity growth was lower than the other two countries, reaching 14%. This result supports the argument of Györfy (2022) that the focus of the Hungarian growth model during this period was on employment growth and not on productivity growth. However, this does not bode well for avoiding the middle-income trap. In contrast, the Romanian leading sectors had productivity levels above the regional average (135%) and productivity growth was the highest of the three countries (123% on average). The best performers in terms of labour productivity were retail trade with a growth rate of 404%, and transportation and storage with a growth rate of 88%. Overall, Romania had the best labour productivity performance of the three countries.

Graph 2: Labour productivity level (2018) and labour productivity growth (2011-2018)



Source: Author based on Eurostat (2021)

Graph 3: Labour productivity level and foreign dominance (2018)



Note: Linear trend line was fitted to the data points

Source: Author based on Eurostat (2021, 2022)

The Graph 3 shows the relationship between the foreign dominance and the level of labour productivity. It implies that foreign dominated sectors tend to have higher productivity levels compared to domestic dominated sectors. This is obvious as the foreign firms are much more productive than the domestic firms, but it still shows the dualistic structure of the economy of the three countries. Moreover, this result draws attention to a crucial

problem, as it is inevitable to increase the productivity of domestic firms in order to avoid the middle-income trap.

5 Conclusion

The results of the research confirm that it is worth analysing growth models on a sectoral basis, as this can lead to a number of new conclusions. Regarding the research question on leading sectors, our results show that the two of the five leading sectors were the same in the three countries: information and communication and retail trade. Nevertheless, we can identify diverse sectoral specialisation in the three countries. In Bulgaria tourism and real estate activities, in Romania transportation and storage and retail trade, and in Hungary administrative soft services and automotive industry played an important role. Our analysis confirms the crucial role of foreign dependence in the information and communication and manufacture of motor vehicle sectors. These sectors were among the leading sectors in Hungary and Romania. Therefore, our analysis suggests that the dependent growth model is more appropriate for Romania and Hungary, and to a lesser extent for Bulgaria. This supports the argument that the Romanian growth model is catching-up with the V4 dependent model. Regarding the middle-income trap, we looked at labour productivity growth and levels. Our research points out that Romania is the best performer among the three countries in this respect. In contrast, in Bulgaria's productivity levels are low, and Hungary's productivity growth has been sluggish over the analysed period. The latter can be attributed to the employment focus of the Hungarian economic policy (Györffy, 2022).

The results of the research provide a more nuanced picture of the dependent market economy model. Contrary to expectations, the region is not just a "manufacturing assembly plant". The results highlight the importance of soft (Hungary) and hard service sectors (Romania and Bulgaria) in the leading industries. Although the appearance of automotive sector in Hungary and Romania reinforces the assembly plant narrative, the results also show that automotive sector it is far from the only driver of growth.

The paper argues that thinking in terms of leading sectors can be valuable for future industrial policy planning. It is important to stress that modern industrial policy does not only focus on industry but also on services sectors. Moreover, in the context of a knowledge-based society, industrial policy does not imply the dominance of the state by eliminating the market, but encompasses the totality of state and market instruments subordinated to economic policy objectives (Trautmann & Vida, 2021; Baranyi, Balogh, & Bósz, 2022). The paper shows that one of the key economic policy objectives for the region should be to increase the productivity levels of domestic firms, in which increasing human capital and knowledge play an important role. Consequently, it is useful to look at the country's leading sectors to see which of them have potential in terms of productivity growth and domestic knowledge accumulation and which do not. Furthermore, examining leading sectors can also be used to evaluate which sectors need to reduce their dependency. Overall, leading sector analysis can provide important input to the creation of successful plans to bring the existing structure closer to the desired goals.

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Challenges for Bulgarian Industry and the National Recovery and Resilience Plan (NRRP) Implementation

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Abstract: The implementation of the main projects laid down in the National recovery and resilience plan of Bulgaria is aimed at environmentally friendly technologies, at the circular economy, at digitalization and at the application of innovative business models. Effective financing under the Recovery and Resilience Facility is a mechanism for successful investment projects, contributing to the reconstruction of the Bulgarian industrial sector. The emphasis falls on the Bulgarian industry, on the new European policy and mainly on the National recovery and resilience plan, as a basis for increasing the efficiency of Bulgarian industry. However, a series of issues remain open for resolution in connection with the effective investments of financial resources received, the transparent reporting of results, the highlighting the goals of the Bulgarian industrial policy etc.

Key-Words: - Industrial development, Recovery and Resilience Facility, RRF, National recovery and resilience plan, NRRP, The New EU Industrial Policy, Bulgaria.

JEL classification: L16, O33, O34, E66

1. Introduction¹

The industry occupies a significant share of the gross added value and GDP of Bulgaria. That is why the improvement of the industrial sector and the implementation of policies that will allow the successful implementation of new technologies and the successful deeper inclusion in the European industry are of primary importance for Bulgaria.

The new European industrial policy is aimed at a long-term change of the paradigm of linear development and aims at a complete transformation of the foundations on which the European industrial model is based. Bulgaria also directs the policy towards environmentally friendly business models, towards a circular economy and digitalization. The Recovery and Resilience Facility (RRF) financing is of primary importance for the economy and industry of Bulgaria.

The implementation of the main projects laid down in the National recovery and resilience plan (NRRP) of Bulgaria depends on successful financing under the RRF and the effective investment of these funds in the Bulgarian economy and mainly for the construction of a modern industrial sector in Bulgaria.

The emphasis falls on the Bulgarian industry, on the New European Policy and mainly on the RRF financing, as a basis for increasing the efficiency of the Bulgarian industry. However, a series of issues remain open for resolution in connection with the financial resources received, such as effective investments, reporting of results, highlighting the goals of the Bulgarian industrial policy and other problems.

2 Bulgarian industry, remaining one of the main pillar of the economy and the National Recovery and Resilience Plan (NRRP)

2.1. The Covid-19 crisis and its impact on the Bulgarian economy

Bulgarian industry is experiencing the consequences of the unstable and uncertain economic and political environment in the EU and in the world, and in particular in connection with the energy crisis, which imposes

¹ The paper was presented at the trilateral Roundtable *Adjustment of the CEE Economies to Long-Term Challenges and Overlapping Crises*, organized online by the Institute for World Economy, Romanian Academy, November 9, 2023.

challenges for the production potential of companies and their competitiveness, as well as attracting foreign direct investment (FDI). Real labor productivity remained stable, increasing after 2012, driven mainly by the manufacturing sector.

The COVID-19 pandemic crisis has had a significant impact on the EU industrial production because it has negatively affected both demand and supply along the external and internal channels of transmission of crisis. Since the beginning of the crisis, the potential of industrial enterprises and employment has decreased, and as a result, a decline in industrial production of developed industrial economies has been recorded. Bulgarian economy, as an integral part of the EU Single market experienced a slowdown in all economic sectors, because of the strong impact of external and internal factors.

The crisis that followed the COVID-19 pandemic of the beginning of 2020 interrupted the decade of growth for the Bulgarian economy, but the economic consequences are weaker than the initial forecasts and fears. Bulgaria's real GDP fell by 4.4% in 2020 and by 0.4% in 2020 and 2021 combined. Consumer spending and exports, supported GDP growth, while investment in fixed assets declined in 2021 and 2022. High employment levels, combined with increases in wages and government energy support measures, supported consumer spending. In 2022, Bulgaria was the EU Member State with the lowest GDP per capita, at 38% below the EU average (Eurostat, 2023a).

The COVID-19 pandemic had a negative impact on the Bulgarian economy and industry. The Bulgarian GDP grew significantly by 7.6% in 2021, after an output decrease by 4% in 2020. In parallel, inflation rose in the second half of 2021 as fuel and food prices rose (OECD, 2021). In 2022, the GDP growth rate was of 3.4% despite high inflation rates and political uncertainty.

Consumer spending and exports spurred GDP growth, in contrast to investment in fixed assets, which declined in 2021 and 2022. High employment levels, combined with increases in wages and welfare benefits and government energy support measures, stimulated consumer spending. The growth of exports in 2022 was encouraged by the opportunity to overcome shortages in the supply of energy, food, metals and other materials.

Although the initial rise in inflation was largely driven by external factors, such as high energy and food prices, domestic factors have become increasingly important. Average annual consumer price inflation (HICP) was 13% in 2022, well above EU headline inflation of 9.2%, but still below inflation rates in the Baltic states, as well as Poland, the Czech Republic and Hungary. Nominal wages grew by 16.4% in 2022, well above the rate of inflation. Rapid wage growth creates the potential for spillover effects and greater inflationary resilience.

According to the NSI data, the industrial sector decreased its relative share in the added value of the economy by 0.6 percentage points from 35.0% to 34.4% between the first quarters of 2022 and 2023, but the relative share of added value generated by activities in the service sector, including the industrial service sector, increased to 63.1% in the first quarter of 2023, compared to 62.7% in the January-March period of 2022. The data indicate that the main long-term processes taking place in the Bulgarian economy continue and are not deeply affected by the crisis. Some of the branches of the manufacturing industry have already reached pre-crisis levels of activity. This trend does not diminish the importance of Bulgaria's industrial sector, which provides a significant percentage of added value.

The shock in industry and a large part of services was sharp, but short-lived - recovery began in the middle of 2020. Bulgarian industrial enterprises, as well as sectors of services related to industry, are included in the European and global value chains of supply and trade, which activities have been disrupted during the Covid-19 pandemic and the irregular supply of goods and services had a negative impact on Bulgarian companies. The percentage of imported value added from EU industries and from third countries in the Bulgarian industry is higher in comparison with the realization of value added in Romanian industry, which is much more from national sources.

2.2. National Resilience and Recovery Plan and the funding of Bulgarian industry

On 15 October 2021, Bulgaria submitted to the Commission its National Recovery and Resilience Plan in accordance with Article 18(1) of Regulation (EU) 2021/241. The Recovery and Resilience Plans should contribute to the overall objectives of the Recovery and Resilience Facility (RRF) established by Regulation (EU) 2021/241 (hereafter "the Facility") and the European Union Recovery Instrument established by Regulation (EU) 2020/2094 of the Council to support the recovery after the COVID-19 crisis. They should promote the economic,

social and territorial cohesion of the EU, contributing to the six pillars referred to in Article 3 of Regulation (EU) 2021/241.

Under the RRF, the EU's response to the pandemic crisis, for Bulgaria was initially allocated the amount of 6267.3 EUR million in grants. The Bulgaria's National Recovery and Resilience Plan (NRRP) has an estimated cost of 6897.9 EUR million, exceeding the maximum financial contribution under the RRF, which is expected to be supplemented by national (and private) co-financing. Under the RRF Regulation, Member States can request loans under the RRF until 31 August 2023 – something that Bulgaria has not done yet.

According to the NRRP, Bulgaria ranks one of the first places (after Croatia) in terms of the share of grants in relation to the gross domestic product (GDP) — initially 10.2% of GDP for 2019, with the RRF amounting to 5.2% of the EU-27 GDP. For the financing under the RRF, obligations should be assumed by the end of 2023 and it should be paid to Bulgaria by the end of 2026. Bulgaria is among the five Member States that cannot receive 13% pre-financing.²

The NRRP aims to overcome the main challenges and systemic weaknesses of the Bulgarian economy. It is based on the national development program "BULGARIA 2030", which proposes solutions for growth and development in the medium term.³ Bulgaria is one of the main beneficiaries of EU funds (measured as a share of GDP) during the 2021-2027 funding period, and with the complementarity of RRF resources, this funding is of particular relevance for several areas and especially climate changes (58.9%) and digital technological initiatives (25.8%). Thus, both minimum expenditure targets (environmental and digital) set out in the RRF Regulation have been exceeded. The NRRP consists of 12 components grouped into four policy pillars, as follows:

Innovative Bulgaria – (1745.5 million EUR) aimed at increasing the competitiveness of the economy and transforming it into an economy based on knowledge and smart growth.

Green Bulgaria – (2893.5 million EUR- 45% of the total funds) with a focus on the sustainable management of natural resources, enabling the current needs of the economy and society to be met.

United Bulgaria – (1262.1 million EUR) focusing on increasing the competitiveness and sustainable development of regions of the country, such as the improvement of transport and digital connectivity, as well as the promotion of local development.

Just Bulgaria – (996.4 million EUR) with a focus on disadvantaged people and with an emphasis on building efficient and responsible public institutions.

NextGenerationEU⁴ is primarily aimed at improving the competitiveness of European industry. In 2020 (September) and in 2021 (May), the EC adopted a European Industrial Strategy, which aims to overcome the European companies' dependence of imports of strategic raw materials and industrial goods from third countries, to support of SMEs and start-ups and towards accelerating the ecological and digital transition.

The NRRP is focused on the decarbonization of the energy sector, sustainable agriculture, sustainable mobility (rail and public transport), modernizing the education system and infrastructure. The first pillar - "Innovative Bulgaria" aims to make a transition to a knowledge-based economy based on smart growth and to increase the competitive advantages through measures in the fields of education, digital skills, science, innovation and technology and their interconnectedness. This part of the plan has a close relation with the implementation by Bulgarian industry of the EU New Industrial Policy.

"Smart Industry" – (800.7 million EUR, 12% from the total funding) is one of the main component of the pillar "Innovative Bulgaria" and includes measures aimed at creating favorable conditions for private investment, in particular attracting industrial investment and developing industrial ecosystems, as well as helping SMEs and start-ups to upgrade their technologies and adopt green, circular and digitally oriented business practices. The investments include an economic transformation program, a business support program consisting of grants and financial instruments and a program to support the infrastructure development of industrial parks and zones.

² A necessary condition for requesting such funding was that the Council's implementation decision be adopted by 31 December 2021.

³ Economic development, demographic upsurge and reduction of inequalities. The NRRP aims to widen the scope of reforms and investments, while ensuring consistency with measures planned under the EU's cohesion policy.

⁴ NextGenerationEU is more than a recovery plan of 806.9 billion EUR and an opportunity to implement investment projects in the framework of the European Green Deal and the digitalisation and the reform of the EU industries.

The largest part of the funding is planned for *Green Bulgaria*, namely 45% of the total. The largest number of projects will be implemented in the area of *Just Bulgaria* - a total of 28. This is also the pillar with the highest share of European funding from the total costs in the area - 83%. *Innovative Bulgaria* is the second largest pillar – over 1/4 of all, but the one with the smallest number of projects (8). In *United Bulgaria*, the state self-participation has the smallest share – 4%, with the rest being under the RRF and private co-financing. Bulgaria received the first payment under the NRRP in the amount of 1.37 billion EUR (December 2022).

Table 1: Top ten investment projects contributing to climate and digital goals – share of the total NRRP

Projects	Millions of EUR
Renewable energy sources	800.1
Buildings	608.2
Production of electricity from renewable sources	342.0
Railway	295.4
Digital infrastructure	269.6
Public buildings	193.1
Digital transformation of the power grid	189.2
Renovation of kindergartens	179.9
Electricity and geothermal sources	175.4
Digital skills	164.7
Share of total funds of NRRP	51.3%

Source: European Parliament (2022).

The European Commission approved the amended Bulgaria's NRRP (21 November 2023). The plan is currently worth 5.7 billion EUR in grants under the RRF. In the amended plan, Bulgaria proposed 22 measures to be removed, reduced or amended. The amended plan of Bulgaria continues to stimulate the ecological (57.5% of the funds allocated under the plan) and digital transition, and to strengthen the economic and social sustainability of Bulgaria.⁵ The second payment under the NRRP is awaited up to the end of 2023.

A large number of EU Member States envisage using only grants, with most having submitted recovery and resilience plans underlying the necessity of receiving the full amount of EU grants under the RRF. Bulgaria is no exception.

The additional possibility of debt financing is asked by a small number of countries. The main part of the reforms is presented through the instruments for the implementation of a number of conditions (such as Change of legislation, formation of working groups and commissions, development of strategic documents, creation of administrative structures). This means that in practice, the reforms diverge from their content, and the latter in some cases it is not even clearly defined.

2.3. Challenges for Bulgarian industry and the EU New Industrial Policy

According to the EU New Industrial Policy, Bulgaria must implement strategic industrial projects of common European interest, which are designed to develop the timely entry into the EU market of innovative technologies and large infrastructure projects. The December 2020 proposal for a regulation of the production of batteries aims to improve turnover and resource efficiency through the recycling and recovery of strategic raw materials, to improve Europe's strategic autonomy. The minimum levels of recovered cobalt, lead, lithium, and nickel from waste for re-use in new batteries are determined.

⁵ The Commission notes that Bulgaria's request is based on the need to take into account the downward revision of the maximum amount of grants under the RRF, from EUR 6.3 billion to EUR 5.7 billion. The revision is part of the update of the coefficient of allocation of grants under the RRF from June 2022 and reflects the comparatively better economic results of Bulgaria in 2020 and 2021 compared to the original forecasts.

Average annual industrial producer prices rise in 2022 (37.8% vs. 15.3% in 2021) considering that annual energy commodity prices increase by 135% (September 2022), which affects manufacturing capacities of Bulgarian companies. Long term structural factors continue to weigh on Bulgarian investment and industry and has an impact on the potential economic growth.

Over the past 2 years, fixed capital investment declined by a cumulative of 12.3%, with both private and public investment contributing to the decline. In addition, the limited inflow of FDI, the lag and lack of efficiency of public investments, including investments supported by EU funds, the unfavorable business environment and the excessive concentration of economic activity in one region have a negative impact on aggregate investment. Technology upgrade and transfer are hindered by the low share of public sector, of R&D expenditure. Bulgaria's productivity per hour worked is around 55% of the EU average in 2022 (PPP) (Eurostat, 2023b), there are a shortage of workers in the service sector and a necessity of wage indexation.

There is no connection between individual projects (perhaps with the exception of projects in the field of energy), which means that they were most likely developed independently and before it has been cleared the whole concept of the reforms and the development of the sectors.

The use of public procurement is the main way for the state to transparently and regulated select a contractor and spend public funds. The level of control in public procurement should be at a very high level to prevent irregularities and abusive schemes, which is often the case in Bulgaria.

Around 3/4 of the costs are construction/rehabilitation of infrastructure and physical capital (purchase of machinery and equipment). The remaining 1/4 is human capital, labor and technology. The recovery plan is effectively used as a substitute for national investment program in a number of sectors.

The postponement of reforms and projects in the second half of the plan (after 2023) may turn out to be a waste of valuable time. The Bulgarian plan is "drawn" back in time - to the point of asking whether this is a recovery plan after a severe crisis or a tool for realizing investment goals.

According the collect of data from the industry there are no clearly defined goals and indicators. The indicators are not formulated in a way that allows evaluation of the results and effects of the implementation of the projects. In conclusion, the low quality of the evaluation indicators shows weaknesses in the development of projects suitable for funding.

Even after the approval of NRRP by the European Commission, and the process of financing is starting, there are some doubts whether these funds will not become another scheme for waste and inefficient spending of money without a clear end and useful results.

The goals of the New Industrial strategy and the effective financing under NRRP can be attained with a lot of difficulties in the Bulgarian case.

Attracting quality investment in the industrial sector remains of paramount importance. The future is that Bulgaria must adapt its industry to the requirements of the New EU Industrial Strategy from 2021 and, on this basis, the funds under the NRRP should be used in the most favorable way, as well as with the financial support from the Cohesion Fund. In addition to the support from the RRF, Bulgaria benefits from EU cohesion policy funds (11 billion EUR, which represents about 13% of GDP in 2022).

The European Commission may act as a procurement entity on behalf of certain Member States for public procurement of certain goods from certain strategic industries. In December 2021, the European Commission proposed a market package for hydrogen and decarbonized gas - a key raw material for industrial processes. The package aims to strengthen energy security and global industrial leadership.

3. Conclusion

The main goal of the Bulgarian NRRP is the digital transformation of industry in Bulgaria with measures to support the digitization of enterprises, improvement of competition, and the deployment of broadband access. Investments in areas such as electricity storage capacity, digitalization and sustainability of rail transport and smart water management make an important contribution to both environmental and digital transformation of the industries.

The measures in the plan also contribute to creating favorable conditions for investment in industrial parks and zones. Reforms and investments should support the improvement of the scientific research and

innovation ecosystem, thus increasing the results of innovation in Bulgaria, promoting technology transfer and commercialization of research results, which should permanently stimulate economic growth.

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Progress and Challenges of the NRRP Low Carbon Economy Reforms in the Residential Building Sector in Bulgaria

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Abstract: The article analyses the progress and challenges encountered in implementing low-carbon economy reforms within the building sector, as mandated by the National Resilience and Recovery Plan as a component of the instruments supporting the EU Green Deal. It highlights the role of the building sector in the broader policy framework for economic decarbonization, delves into the formulation of the reforms and identifies key issues within them, while also addressing the challenges faced in their execution. In conclusion, the article asserts that the anticipated outcomes of the reforms fall short of expectations, warranting a reassessment, redesign, or additional corrections for their effective application.

Key Words: Environmental Sustainability, Housing, Government Policy

JEL Classification: K32, Q56, Q58, 018

1 Introduction¹

The introduction of emission trading scheme 2 (ETS2) (EC, 2021a) and the building sector decarbonization in particular will play an important role and have a key impact on achieving the goals of the Green Deal (Held et al., 2022; Matthes and Graichen, 2022; EC, 2021b, 2021c). In 2020, the EU initiated the "Renovation Wave" strategy (EC, 2020), aiming to enhance the sustainability of building stocks, create jobs, boost the post-pandemic economy, and alleviate energy poverty. The strategy involves targeted actions, reinforced energy efficiency directives, and financial facilitation. The initiative aims to alleviate the financial burdens associated with upfront costs for energy-efficient refurbishment. Additionally, it seeks to increase awareness, improve capacity, and set up one-stop shops to streamline the process of undertaking high-quality renovation projects for homeowners and small to medium enterprises.

Renovation activities are envisioned to combat energy poverty and improve housing access. However, current spending on energy-efficient buildings is eclipsed by conventional construction investment. The slow pace of energy-focused renovations affects less than 1% of the building stock annually (EC, 2021d), and the lack of funds and working co-financing mechanism is a notable challenge in Bulgaria in particular (LTRS 2030). To expedite progress and justify upfront costs, a necessary reform to introduce a co-financing mechanism was proposed in the National Resilience and Recovery Plan (NRRP, 2021).

The primary challenge addressed in this research is the decarbonization of Bulgaria's building sector, identified as one of the five key reforms for a low-carbon economy in the NRRP. Despite contributing only 8% to the carbon emissions in the country, the building sector faces a substantial task due to the low rate of building renovation and limited adoption of rooftop renewable energy sources (RES) (LTRS 2030). The reform focuses on establishing a financing mechanism for energy efficiency and renewable projects through energy bills, with specific attention to protecting vulnerable households. Challenges include the need for amendments to multiple laws (Territorial Planning Law, Condominium Law, Energy Law, and Renewable Energy Law), administrative reforms for capacity-building in various regions, and the creation of co-financing models and energy

¹ This paper was presented at the online Romanian-Bulgarian Workshop as part of the Project "The World Economy on the Edge of a Deep Recession. Solutions for a long-lasting recovery" – Institute of World Economy, Romanian Academy and Economic Research Institute, Bulgarian Academy of Sciences, October 6, 2023.

communities. The reform is tied to significant investments, which however represents only a fraction (1.5%) of the total inhabited multifamily buildings in Bulgaria. The broader challenge lies in achieving widespread decarbonization, considering the limited impact of previous national programs and the absence of statistical data on renewable energy adoption in individual houses. The success of the reform hinges on overcoming legislative, financial, and implementation hurdles to transition towards a more sustainable and low-carbon building sector.

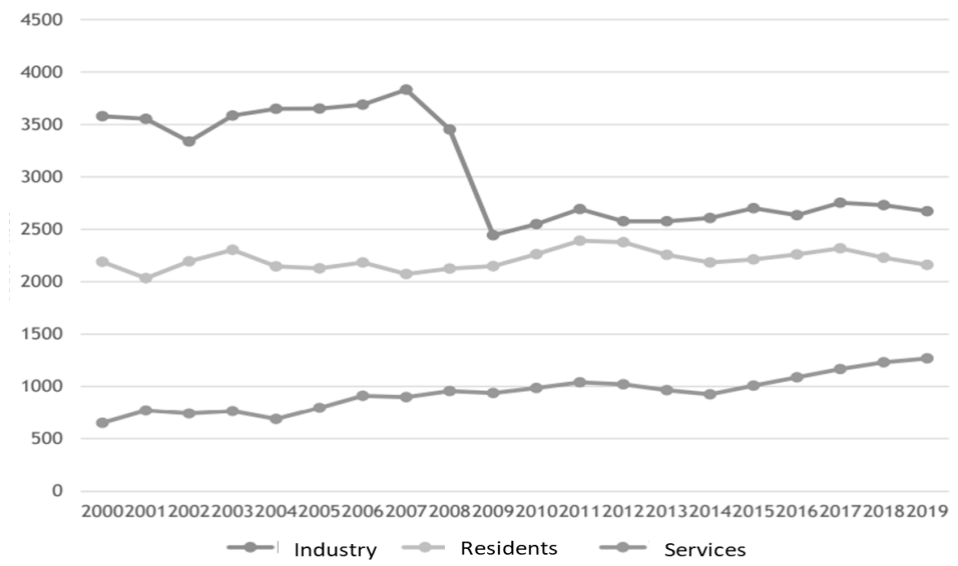
2 Role of the Building Sector in the Decarbonization Process

Buildings contribute to 33% of the current worldwide CO₂ emissions, encompassing both operational emissions and the embodied emissions of materials (IEA, 2021). The buildings sector bears a substantial emissions burden (UNEP, 2022), directly and indirectly contributing to approximately one-third of global CO₂ emissions (IEA, 2022). In 2021, fossil fuel use in buildings constituted around 8% of global energy-related emissions, while 19% resulted from the generation of electricity and heat for buildings. Additionally, 6% of emissions were attributed to the embodied emissions from building materials like cement, steel, and aluminum. Beyond CO₂, fugitive emissions from fluorinated greenhouse gases, particularly hydrofluorocarbons (HFCs), representing about 80% of such emissions, accounted for 8% of the buildings sector emissions in 2020 (Downey et al., 2021; Hu et al., 2020).

Addressing energy consumption in buildings is crucial due to their substantial contribution to final energy use in numerous countries. In Bulgaria, heating alone constitutes 36% of the total final energy use and a significant share within the residential sector (Ministry of Energy, 2020; Peneva, 2022). The sector alone consumes over 6100 GWh per year from fossil fuels and 2003 GWh from renewable fuels as of 2019, according to the report.

Given this considerable energy consumption and the relatively uniform nature of the private household sector, particularly when compared to other economic sectors such as industry or services, there are promising opportunities for the effective implementation of energy-saving measures, with a specific focus on room heating.

Figure 1: Final Energy Consumption by Sector in Bulgaria, ktoe



Source: Ministry of Energy of Bulgaria, National Statistical Institute.

In Bulgaria's NRRP, the decarbonization of the building sector constitutes one of the five reforms for a low-carbon economy. The other four reforms include creating a National Decarbonization Fund, stimulating electricity production from RES, developing a National Road Map for hydrogen technologies, establishing a Commission for energy transition and developing a Road Map for climate neutrality.

Despite the building sector contributing only 8% to Bulgaria's carbon emissions, its decarbonization presents a significant challenge due to low building renovation rates and limited deployment of rooftop RES. The reform focuses on establishing a financing mechanism for energy efficiency and renewable projects through

energy bills. Within this reform, measures to protect vulnerable households include adopting an official definition for energy-poor households and promoting energy efficiency and renewable energy projects through energy bills. These initiatives involve amendments to the Territorial Planning Law, Condominium Law, Energy Law, and Renewable Energy Law. Administrative reforms encompass building capacity for one-stop-shops in 28 regions, creating co-financing models, and developing energy communities.

The building sector decarbonization reform is closely tied to investments in two measures: a 1.3 billion Euro program for energy efficiency in multifamily buildings and a 123 million Euro program for financing single measures for renewable energy in single-family and multi-family buildings. These programs include sub-measures for constructing solar systems for domestic hot water supply (with households receiving no more than BGN 1,960.83) and photovoltaic systems up to 10KW. The maximum grant for an individual household is planned to be up to 70% of the system's value, but not exceeding BGN 15,000.

The anticipated impact of this investment package involves renovating approximately 1200 buildings and installing RES equipment in nearly 10,000 households. This corresponds to around 1.5% of the total 66,000 inhabited multifamily buildings in Bulgaria, with less than 4% having been completely renovated through national programs (less than 2500 buildings) (LTRS 2030). In comparison, Bulgaria has 1.5 million individual houses, but there is no available statistical data on how many have installed RES equipment. Notably, this marks the government's first program of this nature.

3 Challenges of the Reform

3.1 Challenges related to the basic situation in Bulgaria

The challenges facing building sector decarbonization in Bulgaria extend beyond policy design and are intricately linked to the country's fundamental situation. Economic constraints play a pivotal role, as limited financial resources and competing budgetary priorities may impede the allocation of sufficient funds for large-scale sustainable projects. Socioeconomic disparities within the population also pose a challenge, hindering widespread participation in energy-efficient measures due to financial constraints and a lack of awareness and education about sustainable practices.

Inadequate infrastructure, especially in older buildings, constitutes a significant obstacle to implementing energy-efficient technologies. Retrofitting existing structures to meet modern sustainability standards demands substantial investment and may encounter logistical challenges. Bulgaria's reliance on traditional energy sources, such as coal, further complicates the transition to renewable alternatives. Existing infrastructure and economic dependencies on traditional energy sectors could slow down the adoption of greener technologies.

A general lack of public awareness and understanding about the benefits of decarbonization and sustainable building practices can hinder the success of initiatives. Without an informed public, there may be resistance or insufficient demand for energy-efficient solutions. Regulatory and administrative hurdles, including bureaucratic processes and legal complexities, present additional challenges, emphasizing the need for streamlined procedures to facilitate effective implementation.

Insufficient technological integration in the building sector is another concern, potentially limiting the adoption of advanced energy-efficient solutions. The lack of access to and familiarity with cutting-edge technologies may restrict the scalability and impact of decarbonization efforts. Cultural and behavioral factors, such as traditional preferences in construction and reluctance to change, also influence the willingness of individuals and businesses to adopt new, sustainable practices in building design and energy use.

Addressing these fundamental challenges requires a comprehensive approach that combines policy adjustments with broader efforts to enhance public awareness, invest in infrastructure, and overcome economic and cultural barriers to sustainable development.

3.2 Challenges related to the NRRP's design

The initial conceptualization of the building sector decarbonization reform and investment, while holding promise, has encountered a series of challenges as of October 2023. One primary issue stems from the lack of synchronization between the investment and the reforms, leading to delays in the reformative processes. This disjointed timing has compelled the initiation of the investment before the completion of corresponding reforms. Originally structured with the intent of offering 100% grants, subsequent phases were forced to commence with

reduced 80% grants, requiring households to co-finance with their own capital. This unintentionally excluded energy-poor households, contradicting the inclusive principles advocated by the Green Deal. While the initial phases generated considerable interest, the second phase, initiated in June 2023, lacked enthusiasm due to the lingering incomplete reforms. The absence of finalized reforms also hampers households' access to low or zero-interest credits, undermining the intended support for energy-poor households.

Another significant challenge arises from the lack of integration with other reforms, notably the absence of the decarbonization fund. This absence hinders the provision of specific support for vulnerable households, leaving 2000 buildings without approved 100% grant funding. The lack of a comprehensive communication campaign has left many stakeholders unaware of the cessation of 100% grants, resulting in reduced active participation in co-financing phases. The absence of an efficient co-financing mechanism raises concerns about the potential for Bulgaria's decarbonization process to become costly, slow, and less effective.

Thirdly, the successful implementation of reforms necessitates effective multisectoral coordination, encompassing housing, energy, and social policies. Despite assigning leading ministries for each reform, poor coordination has resulted in incomplete or paper-based reforms. Notably, the financing of energy efficiency measures through bills remains unimplemented, and the establishment of one-stop-shops has been significantly delayed. The mechanism designed to protect vulnerable households lacks essential details, including the competent governmental body and fund names. Furthermore, the second phase of the building renovation program lacked a proper communication campaign, raising concerns about the overall risks associated with the reform's implementation. Addressing these multifaceted challenges requires a comprehensive and integrated approach that goes beyond mere legislative adjustments, encompassing streamlined communication strategies and enhanced coordination mechanisms.

4 Conclusions and Recommendations

Conclusions

Despite the positive momentum in reforms and successful investment outcomes, concerns about the long-term sustainability of the decarbonization process have arisen. Following the financial support provided by the NRRP, there is a crucial need for the establishment of enduring, constant funds, and co-financing mechanisms. Unfortunately, both Bulgaria and Romania experienced the highest share of food and energy expenditures in households' disposable income in 2021, accounting for 75% of the total income. This financial constraint leaves little room for long-term investments across a significant portion of the population. The impending liberalization of the electricity market is poised to further diminish households' capacity to undertake enduring measures for low energy consumption.

Simultaneously, the foreseen commencement of the social climate fund in 2026 is anticipated to face sustainability challenges. Bulgaria, having the lowest energy consumption covered by the emission trading scheme in the building sector (ETS 2), implies that, in the absence of European funds, national financing mechanisms will encounter limitations. The revenue from emissions fees collection and private capital investment is expected to be constrained.

In light of these challenges, there is an imperative to reconsider and reshape the reforms and investments associated with building sector decarbonization, particularly in low-income countries. Drawing lessons from the encountered challenges, it is essential to devise effective and appropriate solutions promptly to address the pressing issues at hand.

Recommendations

Addressing the challenges identified in ensuring the long-term sustainability of the building sector decarbonization process requires a thoughtful redesign of policies. Here are several suggestions:

1. Financial Accessibility:

To address financial accessibility concerns, the redesign should focus on income-adaptive financing mechanisms. Introduce tiered subsidies or income-based interest rates to accommodate varying income levels, ensuring that even households with limited financial capacity can participate in and benefit from the decarbonization initiatives. Additionally, establish targeted social support programs tailored to assist vulnerable households, recognizing the high percentage of income dedicated to food and energy expenditures. These

programs can include direct financial assistance, tax incentives, or subsidies specifically designed for low-income families.

2. Long-Term Affordability and Public Awareness:

To ensure the long-term affordability of energy-efficient measures, the policy redesign should include measures such as negotiating favorable agreements with suppliers, incentivizing energy-efficient appliance purchases, and exploring innovative financing models to reduce upfront costs for consumers. Simultaneously, launch comprehensive public awareness campaigns to inform households about changes in grant structures, co-financing requirements, and the impending liberalization of the electricity market. Clear communication is essential to encourage active participation and informed decision-making among the populace.

3. Integration and Emission Trading Scheme (ETS):

It is necessary to promote integration by aligning building sector decarbonization initiatives with existing social programs to streamline efforts and resources. Coordinating with ongoing initiatives can enhance efficiency, reduce redundancy, and maximize the impact of limited funds. Reevaluate the building sector's role in the emission trading scheme to align with the country's energy consumption realities. Adjustments may be needed to enhance the effectiveness of the ETS in promoting sustainable practices within the building sector.

4. Private Sector Engagement and Policy Flexibility:

It is essential to encourage private sector engagement by exploring partnerships with financial institutions, businesses, and investors. Creating incentives for private capital investment can diversify funding sources, reducing dependence on emissions fees and public funds. Design policies with built-in flexibility to adapt to evolving economic conditions and unforeseen challenges. Regular reviews and adjustments can help ensure that policies remain effective and responsive to changing circumstances, contributing to the overall success and sustainability of the building sector decarbonization efforts.

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EU Policies and Goals of the Green Transition of Bulgaria and Romania for 2030

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Abstract: The article analyses the policies of the EU Green Deal, focusing on the initiatives NextGenerationEU, Fit for 55 Package, Just Transition Mechanism, and RePowerEU Plan under the EU program period 2021-2027. It presents the state of play of Bulgaria and Romania as regards the energy and electricity mix and their objectives for reduction of greenhouse emissions, primary and final energy consumption by 2030. The investigation examines both countries' National Recovery and Resilience Plans and the EU funding under the 2021-2027 Partnership Agreements while underlying their role for stimulating green transition policies during the current financial package. The internal and external risks for the implementation of the green policies have been identified.

Keywords: Environmental Taxes and Subsidies, Environmental Sustainability, Economic Integration

JEL Classification: H23, Q56, F15

1. Introduction¹

This article contributes to the analysis on economic impacts of public policies of Bulgaria and Romania for stimulating green energy and energy efficiency aligned with the goals of the Paris Agreement and the EU Green Deal for climate neutrality until 2050. The policies of the EU Green Deal, focusing on the initiatives NextGenerationEU, Fit for 55 package, Just Transition Mechanism, and RePowerEU Plan under the EU program period 2021-2027, have been analysed. It presents the state of play of Bulgaria and Romania in terms of energy and electricity mix and their objectives in the field of green transition.

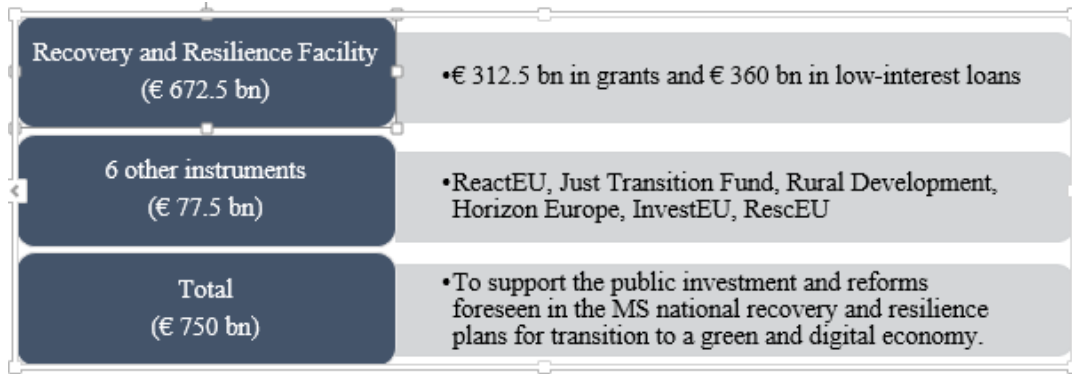
2. EU Policy Initiatives for Green Transition

The EU 2021–2027 Multiannual Financial Framework (MFF) provides further opportunity to invest in the sustainable recovery and green and digital transformation of Bulgaria and Romania. During the programming periods 2007-2013 and 2014-2020, many of the activities for the ecological and digital transition have been funded through the European Structural and Investment Funds and national co-financing, while from 2021 with additional EU funding from the initiatives NextGenerationEU (NGEU), Fit 55, Just Transition Mechanism and RePowerEU under the EU 2021-2027 MFF.

The NGEU with a budget of €750 billion (in 2018 prices) supports the Member States (MS) public investment for sustainable recovery after COVID-19 and reforms towards green and digital transition. In the period 2021-2026, the Recovery and Resilience Facility as the main financial instrument of NGEU with 90% of the total budget finance national recovery and resilience plans of MS. The remaining 10% of the NGEU funding is being spent on modernization of the EU economies, such as research and innovation via 6 other programs (Figure 1).

¹ This paper was presented at the online Romanian-Bulgarian Workshop as part of the Project “The World Economy on the Edge of a Deep Recession. Solutions for a long-lasting recovery” – Institute of World Economy, Romanian Academy and Economic Research Institute, Bulgarian Academy of Sciences, October 6, 2023.

Figure 1: NextGenerationEU financial instruments



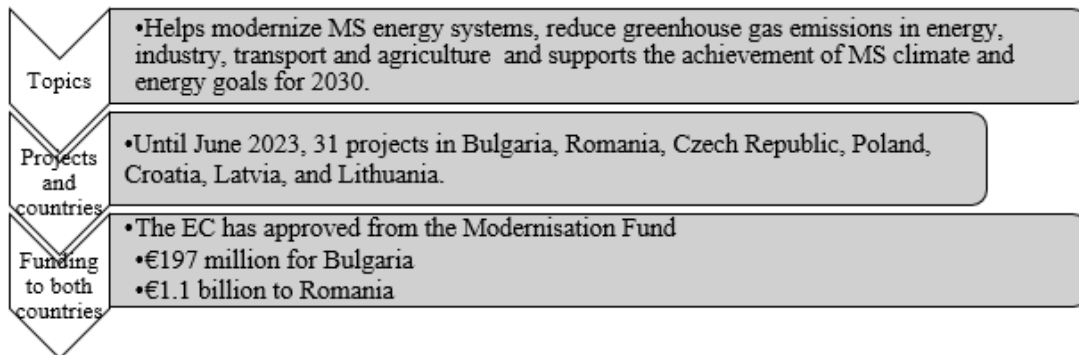
Source: European Commission, https://commission.europa.eu/strategy-and-policy/eu-budget/eu-borrower-investor-relations/nextgenerationeu_en.

The new EU initiative Fit for 55 presented by the European Commission (EC) on 14 July 2021 introduced measures for sectors which were not covered by the EU Emissions Trading System (ETS) established in 2005, including agriculture and forestry sectors, road and marine transport and the building stock.

The initiative also created Social Climate Fund and new CO₂ emission performance standards for road transport and the building stock. Two funds, namely Modernization Fund and Innovation Fund will be financed by ETS allowances to provide funding for projects in MS.

The Innovation Fund has awarded €3.6 billion to 41 large-scale projects of 15 MS (Austria, Belgium, Croatia, Czechia, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain and Sweden), as well as Norway. Until July 2023, the Modernization Fund has provided €2.4 billion (Figure 2).

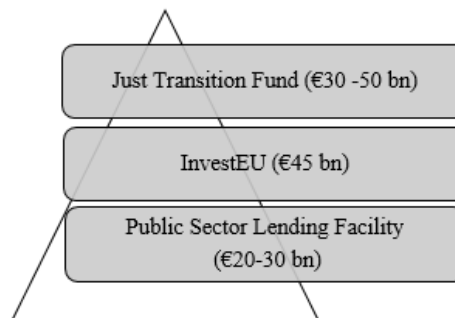
Figure 2. Funds for Bulgaria and Romania from Modernization fund



Source: Official site of Modernization Fund.

Through the Just Transition Mechanism (JTM) the EC plans to financially support the affected sectors of the MS by decarbonisation of the economy with at least €100 billion to ensure their transition to climate neutral production. The JTM consists of three instruments – Just Transition Fund, InvestEU, and Public Sector Lending Facility (Figure 3).

Figure 3: Just Transition Mechanism



Source: Official site of Just Transition Mechanism.

The RePowerEU Plan has been introduced on May 18, 2022 as a new instrument of European green transition policies after Russia's military invasion of Ukraine on February 24, 2022. Additional funding of €210 billion at the EU level is foreseen for the implementation of the RePowerEU Plan, with the MS having to add a separate part in their national recovery and resilience plans. It is based on Fit for 55 package and has been presented together with a range of other documents - the External Energy Strategy, the Solar Strategy, the Energy Savings Communication, the Solar Roof Initiative and the Biomethane Action Plan.

3. Goals of the Green Transition of Bulgaria and Romania

According to the European Green Deal, coal-fired power plants must be closed by 2030 across Europe, which would be a challenge for the energy sector of Bulgaria and other EU member states, especially with the new realities of the war in Ukraine and reduced supplies of Russian gas for Europe. At the same time, this issue is addressed individually for each Member State through the national recovery and resilience plans. There is a reprieve for countries such as Poland and Bulgaria, for which coal-fired power generation is a significant share of their energy mix. The transition to cleaner energy sources and advanced technologies is imperative to meet the EU's commitment to reduce CO2 emissions by at least 55% by 2030 and to become the world's first climate-neutral region by 2050. Although that coal is a key fuel in the European energy mix and accounts for one fifth of the EU electricity generation mix (Tagliapietra, 2020).

Bulgaria relies on its own coal resources and coals products for its energy mix. For 2021 in Bulgaria, coal and coal products provided about 60% of the country's energy mix, while Romania counted on 44% from its oil and natural gas resources. In Bulgaria, nuclear power produces 36% of the country's electricity. In Romania renewables, biofuels and biomass provide 48% of the country's electricity mix (Figures 4 and 5).

Figure 4: Bulgaria: Energy and electricity mix in 2021

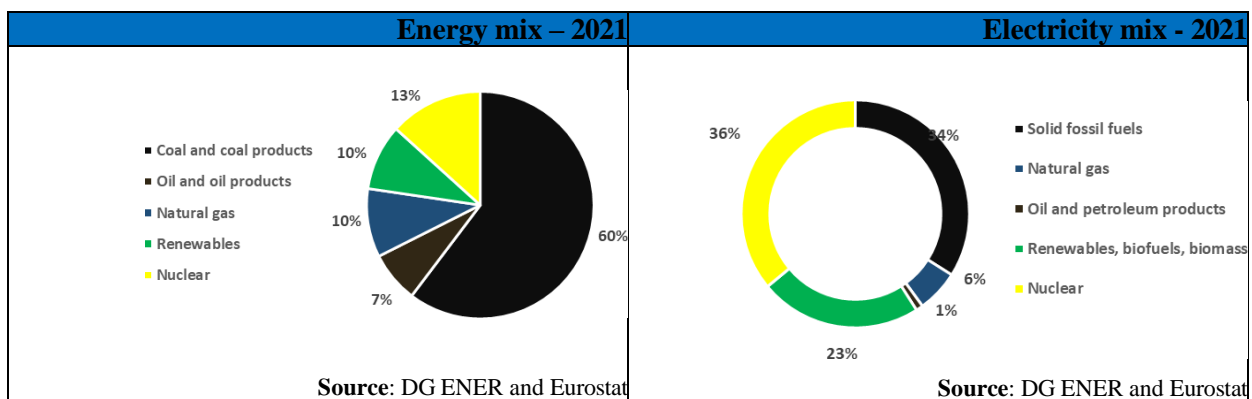
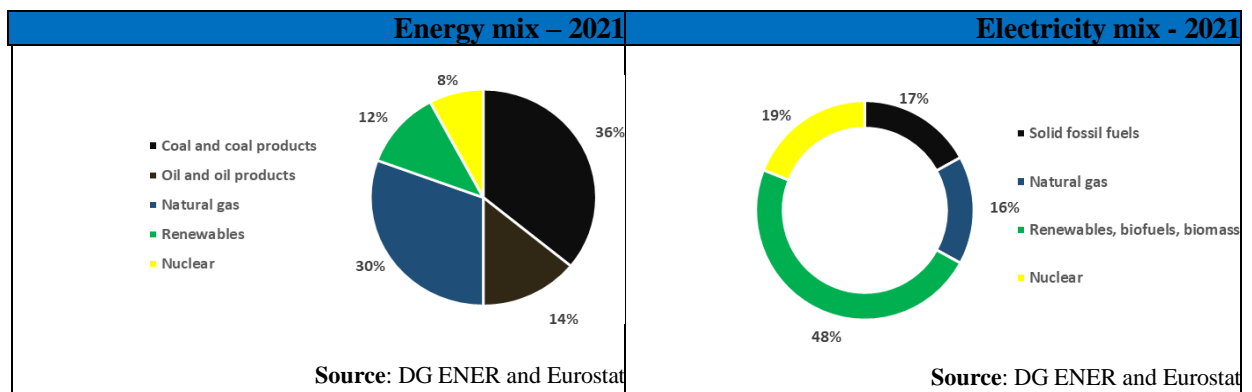


Figure 5: Romania: Energy and electricity mix in 2021

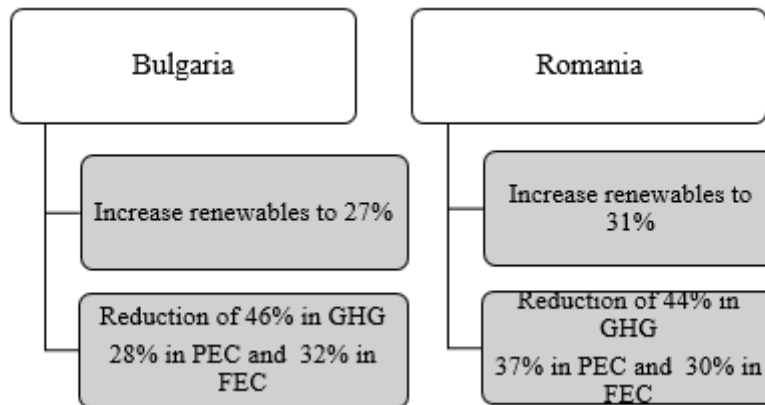


Source: European Commission,

https://energy.ec.europa.eu/publications/state-energy-union-2022-snapshots-eu-country_en

Both countries are net receivers of EU funding, which contributes significantly to their total public investment, including for energy efficiency and the goals for green transition. According to EU climate legislation, coal-fired power plants should be closed by 2030 throughout Europe, which is a challenge for Bulgaria's and Romania's energy sector. The implementation of both countries' policy measures to increase renewables, and to reduce greenhouse gas (GHG) emissions and boost energy efficiency for 2020-2030 should lower in all sectors primary energy consumption (PEC) and final energy consumption (FEC) by 2030 substantially, but less than the 45% target at the EU level. Both countries have similar targets for reduction of greenhouse emissions by 46% for Bulgaria, and 44% for Romania. The goal of Bulgaria is to increase renewables share in the energy mix (Figure 6).

Figure 6: Bulgaria's and Romania's main green targets for 2030



Source: Partnership Agreements of Bulgaria and Romania.

From the 2021-2027 MFF both countries expect substantial financing (Table 1). Bulgaria will not use loans from NGEU for the projects under the Recovery and Resilience Plan of Bulgaria, which puts its public finances in a better position. Romania's Recovery and Resilience Plan has been approved by the EC in 2020 as an important step towards the EU disbursement of €14.2 billion in grants and €14.9 billion in loans to Romania under the RRF.

Table 1: EU funding for Bulgaria and Romania for the 2021-2027 program period (billion euros)

EU funding	Bulgaria	Romania
Partnership Agreement for 2021-2027	10.9	60.9
National Recovery and Resilience Plan	6.3	29.2
Total budget	17.2	60.9

Source: Partnership Agreements and National Recovery and Resilience Plans (2022).

Bulgaria's plan outlines policy objectives and needed investment in four areas, of which *Green Bulgaria* is focused on reducing the energy intensity of the economy and promoting the green transition, and increasing the competitiveness of the agriculture sector. The other program *Innovative Bulgaria* aims to increase the quality and scope of education and training, provide support for research and development, and support the industrial sector. *Connected Bulgaria* aims to build a modern and secure digital infrastructure, reduce the carbon footprint of the transport sector, and increase the competitiveness and sustainable development of regions; while *Fair Bulgaria* is dedicated to achieving inclusive and more sustainable growth, expanding the scope of social services, and strengthening the health system. The plan includes measures to phase out gradually coal and lignite power production by 2038. Bulgaria received the first tranche of €1.3 billion from the EC in December 2022. During

the period 2021-2027 the estimated expenditures under the 2021-2027 MFF, contributing to green transition, amount to 64.01%.

Romania will use the EU funding for the energy sector, mainly through its Sustainable Development Operational Program 2021 –2027. It is focus on promoting energy efficiency measures and GHG emissions reduction and developing smart energy systems, grids and storage outside the Trans-European Networks for Energy (TEN-E). Romania's plan devotes 41% of the plan's total allocation on measures that support the green transition. The plan includes measures to phase out coal and lignite power production by 2032. Romania already received two tranches (€1.8 billion grants and € 0.8 billion loans) in 2022, and a payment request for €3.22 billion have already been provided. During the period 2021-2027 the estimated expenditures under the 2021-2028 MFF, contributing to green transition, amount to 57.17%.

For 2021- 2027 Bulgaria has negotiated a budget of €2.4 billion from the European Regional and Development Fund (ERDF) and Cohesion Fund to help achieve its climate targets. Romania relies on €6.8 billion from the ERDF and Cohesion Fund for green energy projects, reduction of carbon emissions, environmental infrastructure, biodiversity conservation, green spaces, risk management and sustainable urban mobility measures.

The resources of €600 million from EBRD for the 2021-2027 MFF should help Bulgaria increase the share of renewable energy to 27% of total energy consumption as well as reduce energy consumption and greenhouse gas emissions in public buildings. Bulgaria uses ERDF funding also to recycle 70% of all packaging waste. The investments focus on the reduction by more than 1/3 (at least 35%) in the share of the population living at risk of natural disasters, such as floods or wildfires.

In Romania €2.3 billion are envisaged for improvement of energy performance of residential and public buildings and development of renewable energy sources and smart energy systems. The latter aims to reduce energy consumption and carbon emissions and support the decarbonization of the energy sector. Another €2.3 billion support the water and wastewater sector and to improve the circular economy focusing on waste, re-use and recycling.

To alleviate the social and economic impact of the green transition towards a climate neutral economy JTF provides €1.3 billion to Bulgaria. Romania can use €2.1 billion from the JTF for the regions, which are most negatively affected by phasing out coal and lignite, focusing on the transformation of energy intensive industries.

The projects in the national recovery and resilience plans and the partnership agreements of both countries for 2021-2027 are ambitious. For successful implementation the internal and external risks should be overcome. Among internal risks are administrative and political, as well as economic (e.g., high inflation, high electricity prices and labour costs), uncoordinated actions of institutions and stakeholders could have negative impact on the implementation of green projects. Economic and energy crises, war in Ukraine, problems of the supply chains could also prevent the implementation of the projects towards green transition.

4. Conclusion

The EU initiatives are designed to finance investment and structural reforms, with certain shares required to be dedicated to green transition, as well as measures aimed at enhancing the resilience of national economies. The introduction of new economic instruments as part of a broader package of measures provides an opportunity to identify them and to ensure coherence with other policies.

The EU 2021–2027 MFF provides a unique opportunity to invest in the sustainable recovery and green transition in Bulgaria and Romania. Both countries need to improve their institutional capacity to offer good projects and coherence of public and private sector actions as beneficiaries of European funding.

The European procedures and regulations are complex and difficult to apply in the development and implementation of the projects with European funding and assume good institutional support for the beneficiaries, which Bulgaria still cannot achieve. Clear communication by policy makers with stakeholders and civil society is crucial to the success of an economic instrument and can contribute to greater public acceptance.

The governments of Bulgaria and Romania should manage the internal and external risks, and the emphasis should be placed on projects for the decarbonization of the energy sector, which create a negative public response and unpredictability for those employed in this sector.

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Promoting Green Finance through Multilateral Development Banks – The Experience of Romania

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Abstract: Achieving the ambitious climate goals established on the international agenda for boosting sustainable development involves significant financial resources. Therefore, the funds allocated by the financial system for green investments should increase globally. Against this backdrop our paper investigates the role of multilateral development banks in promoting green finance, with focus on Romania. The research results underline their engagement to combat climate change and to support sustainable development. The European Investment Bank, The European Bank for Reconstruction and Development and the International Finance Corporation have major contributions in financing green projects in Romania in areas such as energy efficiency, green building, clean transportation, sustainable agriculture. To this end they established some partnerships with Romanian financial institutions, granted financing facilities, invested in the green bonds issued by local banks, provided technical assistance. However, our main finding shows that green finance in Romania is still limited, requiring increased commitments in this area, including from multilateral development banks.

Key words: climate change, green finance, multilateral development banks, sustainable development, Romania

JEL codes: G21, G22, G23, G28, Q56.

1 Introduction¹

The negative effects of climate change strengthened the need to push the accomplishment of international agenda regarding sustainable development. In this context, on 25 September 2015, the United Nations General Assembly adopted the 2030 Agenda for Sustainable Development, which highlights 17 Sustainable Development Goals, covering "the three dimensions of sustainable development: the economic, social and environmental". The Goal 13 highlights the need to combat climate change (United Nations, 2015). Subsequently, on 12 December 2015, the Paris Agreement, an international treaty on climate change, was also adopted with the objective "to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty". The Agreement aims to limit the increase in global average temperature to below 2 degrees Celsius above pre-industrial levels (and even to below 1.5 degrees Celsius) as well as to reduce greenhouse gas (GHG) emissions (UNFCCC, 2016).

In line with these international initiatives, in 2019, the European Green Deal was adopted. It has the ambitious climate goal of "making Europe the first climate-neutral continent by 2050" (European Commission,

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2021). Hence, the European Commission adopted on 14 July 2021 a package of proposals aimed at reducing net GHG emissions at the EU level by 55 percent by 2030 (as comparison, the 1990 levels were taken into consideration) (European Commission, 2021).

However, these targets require very significant financial resources. Thus, in order to achieve the Sustainable Development Goals, global investments are needed, which, according to the United Nations Conference on Trade and Development, can range between USD 5 trillion and USD 7 trillion per year (UNCTAD, 2014). On the other hand, recently, the International Renewable Energy Agency estimated that achieving the 1.5 degrees Celsius climate goal agreed by the Paris Agreement requires annual investments of more than USD 4.4 trillion (IRENA, 2023).

Against this background, an important role is assigned to green finance which, among others, includes financing of green investments (Berensmann, Lindenberg, 2016). The greening of the financial system is promoted by important actors including banks and international financial institutions (Berensmann, Lindenberg, 2016).

Starting from these considerations the objective of this paper is to investigate the role of multilateral development banks (MDBs) in driving green finance in Romania. According to the above-mentioned objective the remaining of the paper is structured as follows: the first part overviews the role of the MDBs in sustainable development with focus on the European Investment Bank (EIB) while the second part presents some relevant contributions of the MDBs on green finance development in Romania.

2. The role of multilateral development banks in sustainable development

In September 2014, the EIB together with other MDBs - the African Development Bank Group, the Asian Development Bank, the European Bank for Reconstruction and Development (EBRD), the World Bank Group and the IDB - reaffirmed their engagement "*to the implementation of ambitious climate action both to combat climate change and to manage its inevitable consequences*". Among other things, their commitment towards climate finance includes lending, guarantees, technical assistance, promoting harmonization and transparency in the field (EIB, 2014).

The latest edition of the Joint Report on Multilateral Development Banks' Climate Finance highlights remarkable progress in tackling climate change mitigation and climate change adaptation. In 2022, USD 60.9 billion was allocated for low-income and middle-income economies while USD 38.8 billion was directed for high-income economies. The great part of these funds (94% of the total for high-income economies; 63%, for low- and middle-income economies) was allocated for climate change mitigation finance. Thus, at the global level, the MDBs climate finance has reached nearly USD 100 billion in 2022, an important increase from USD 82 billion in 2021 (EIB, 2023a), highlighting the growing role of the MDBs in promoting green finance.

It is important to note that many MDBs adopted post-2020 climate finance targets. Moreover, some MDBs - for example, the Asian Infrastructure Investment Bank - set such a target for the first time (Neunuebel, Sidner, Thwaites, 2021). This is a further proof of the MBDs increased engagement towards sustainable development.

The EIB has committed that 50% of its lending activity will support climate action and environmental sustainability by 2025. Another major measure of the bank refers to the cessation of financing fossil fuel projects at end-2021. The bank has also established that all its financing activities to be aligned with the Paris Agreement (European Parliament, 2023). During 2021-2030, the EIB Group intends to allocate EUR 1 trillion for investments supporting climate action and environmental sustainability (Spinaci, 2021).

In addition, the EIB established as one of its strategic objectives to contribute to the development of the green bond market. Consequently, since its first issuance of Climate Awareness Bond (CAB) in 2007, the EIB's role in the green bond market strengthened both in terms of issuance volumes – EUR 33.7 billion of CABs between 2007 and 2020 – and "*in developing market governance, standards and practices*". It is worth mentioning that the EIB supported the development of the Green Bond Principles - "*the first standardisation initiative in the green bond market*" (EIB, 2021). In this context, it should note the pioneering role of the EIB in green finance (Spinaci, 2021).

At its turn, the EBRD also established that more than 50% of its annual commitments to support green finance by 2025 (EBRD, 2020). By comparison, the EBRD pre-2020 target was 40% of its commitments for environment/climate financing (Neunuebel, Sidner, Thwaites, 2021). Therefore, the new EBRD's Green Economy Transition approach for the period 2021 to 2025 strengthened its commitment towards sustainable development.

3. Some contributions of multilateral development banks to promote green finance in Romania

EIB

In 2023, the EIB Group marked 30 years of partnership with Romania. During this period, the EIB financed over 170 projects with more than EUR 17 billion (EIB, 2023b). Investments in energy efficiency improvements represent an area of great interest for the EIB. To illustrate, the EIB signed a EUR 20.9 million loan in 2023 with the authorities from the Municipality of Oradea to support urban regeneration, urban transport and energy efficiency measures and a EUR 30 million loan with the authorities from Bucharest to boost energy efficiency of residential buildings (EIB, 2023b). We should underline that the EIB contribution in both cities is significant and long-lasting. The bank provided over EUR 480 million between 2005 and 2015 to finance energy efficiency investments in Bucharest. Its commitment towards the city of Oradea began as early as 2008 (EIB, 2018).

In addition to municipalities, the EIB also paid attention to other categories of customers, including small and medium enterprises (SMEs). Thus, in 2019, the bank provided EUR 185 million credit lines to its Romanian partners in order to finance projects of SMEs and municipalities supporting, among others, energy, environmental protection and innovation (EIB, 2020).

Besides financing of green projects, the EIB's activity in Romania consisted in the consultative support provided to the National Committee for Macroeconomic Supervision's Working Group on Green Finance to elaborate recommendations to green the Romanian financial sector (Badea, 2023).

EBRD

The EBRD provided EUR **100 million for the residential** GEFF (Green Economy Financing Facility) in Romania. Its local partners were Banca Transilvania, UniCredit Bank and UniCredit Consumer Financing. These financial institutions used the funds received from the EBRD for green home mortgages and green personal loans (Table 1).

Table 1: GEFF provided by the EBRD in Romania

Local participating financial institutions	GEFF financing (EUR million)	Number of beneficiary households	Type of investment
Banca Transilvania	40	1,757	<ul style="list-style-type: none"> • Energy-efficient homes • Green household technologies
UniCredit Bank	35	602	<ul style="list-style-type: none"> • Energy-efficient homes
UniCredit Consumer Financing	25	5,836	<ul style="list-style-type: none"> • Green technologies and equipment for the home

Source: Authors' elaboration based on GEFF, EBRD (2023a).

Similar to the EIB, the EBRD operations in Romania targeted municipal borrowers and SMEs. The EBRD Municipal Energy Efficiency Financing Facility (MFEFF) in value of EUR 17 million was granted to financial institutions in Hungary and Romania for investments related to energy efficiency and renewable energy. On the other hand, the Romania Sustainable Energy Financing Facility (RoSEFF) (EUR 75 million), addressing the commercial sector, was provided to the following financial institutions: Banca Comercială Română, BRD Groupe Société Générale, Banca Transilvania and BT Leasing as well as UniCredit Bank (GEFF, EBRD, 2023b).

It is worth mentioning that Banca Transilvania and Unicredit Bank were among the most important beneficiaries of the credit facilities received from the EBRD. Within the Romanian banking sector, Banca Transilvania - an institution with majority domestic capital - ranks first by net assets with a 19.11% market share (as at 31 December 2022). Unlike Banca Transilvania, UniCredit Bank (8.62% market share) is a credit institutions with majority foreign capital (BNR, 2023a) that is part from the pan-European Group UniCredit, with presence across Italy, Germany, Central and Eastern Europe (UniCredit, 2023). In fact, credit institutions with Italian capital hold an important share in the Romanian banking sector (9.2% of total net assets, June 2023) along with credit institutions with Austrian capital (23.2%), Dutch capital (11.5%) and French capital (10.7%) (BNR, 2023b).

Concerning the EBRD's role in Romania we should also underline its consultative support provided to the National Committee for Macroeconomic Supervision's Working Group on Green Finance (Badea, 2023).

International Finance Corporation (IFC)

A significant contribution to mitigating the negative effects of climate change in Romania belongs to the IFC, "the largest global development institution focused on the private sector in emerging markets" (IFC, 2023a).

In May, 2021, the IFC invested the equivalent of USD 20 million in the first green bond issued by a local bank, namely Raiffeisen Bank that is a member of the Raiffeisen Group. This initiative was based on the longstanding relationship between the IFC and Raiffeisen Bank build even since 2004. The proceeds from the bond was used to finance climate finance projects in areas including green building, sustainable agriculture, clean transportation (IFC, 2021a). Following this investment, in June, 2021, the IFC invested the equivalent of approximately USD 72 million in the Raiffeisen Bank's second green bond (IFC, 2021b). Later, in November 2023, the engagement of the IFC towards sustainable growth in Romania strengthened by investing EUR 50.8 million in a sustainable bond issued by Raiffeisen Bank (IFC, 2023a).

However, the collaboration between the IFC and the Raiffeisen Bank in green finance field has started prior to these bond investments. We remember the IFC's RON 720 million (USD 168 million equivalent) financing package in 2019 to increase the bank's ability to finance climate, housing and small and medium enterprises (IFC, 2019). Raiffeisen Bank is another large bank in Romania, holding 8.85% of market share (end-2022) (BNR, 2023a).

In the fiscal year 2023, the IFC contributed to the developing of climate financing in Romania by investing EUR 100 million in the green bonds issuance of Banca Comercială Română (IFC, 2023b). Banca Comercială Română ranks second within credit institutions in Romania, with a market share of 13.95% (as at 31 December 2022) (BNR, 2023a).

The contribution of the IFC to finance green housing in Romania includes the investment in the UniCredit Bank S.A. senior bonds issuance performed in 2022, as part from the approved amount of USD 80 million in the bank's Euro Medium Term Notes Programme (IFC, 2022d).

In 2023, to address energy-inefficient housing supply in Romania, the IFC also provided a EUR 100 million financing facility to Banca Transilvania. This new initiative is part of a subordinated bond financing package (EUR 200 million) alongside the Asian Infrastructure Investment Bank (Banca Transilvania, 2023). The IFC supports Banca Transilvania through consultancy projects too. It is worth remembering that the partnership between Banca Transilvania and the IFC is also long-lasting, dating back, as in the case of Raiffeisen Bank, in 2004. (Banca Transilvania, 2022).

Besides investing in green bonds issued by banks, the IFC has also invested in green bonds issued by other category of issuers. To illustrate, in 2021, the IFC invested EUR 42.5 million in a green bond issued by CTP N.V., the largest industrial property developer and manager in the Central and Eastern European region. This investment is used to develop green-certified buildings both in Romania and Serbia (IFC, 2021c).

The IFC's activity in supporting green transition consists in granting green loans too. Thus, the first IFC's green loan extended to a domestic company (Palaus Campus) financed an eco-friendly complex with approximately EUR 72 million (IFC, 2021d).

Similarly, in July 2022, the IFC granted EUR 85 million to Globalworth Holdings Cyprus Limited to promote green commercial projects in Romania (IFC, 2022a). The IFC's attention also turned to the residential sector. To this end, the global development institution provided a EUR 40 million loan to Garanti BBVA Romania to finance green housing in Romania (green loans for home improvement, green mortgages, etc.) (IFC, 2022b).

Moreover, with the EUR 100 million loan provided to Banca Transilvania in 2022, the IFC was responsible for the first blue funding in Central and Eastern Europe. Based on the IFC support, Banca Transilvania can finance projects of micro, small, and medium enterprises in Romania for sustainable use of water including sustainable agricultural irrigation (IFC, 2022c).

We should underline the fact that the IFC involvement in the private sector in Romania is not limited only to the banking sector. For example, one of its investments targets UniCredit Leasing Corporation IFN, a non-bank financial institution; the IFC will invest up to EUR 50 million to finance climate projects and small business (IFC, 2023c).

Despite all these achievements, green finance in Romania is still limited, accounting for only 4 percent of total exposures to the non-financial corporations sector (end-June 2021) (BNR, 2021). Therefore, increased commitments of financial institutions, including multilateral development banks is required.

4. Conclusions

Due to the negative consequences of climate change strengthened and ambitious climate objectives have been established through the international agenda on sustainable development . However to meet these objectives significant financial resources are required and financial institutions, including the MDBs, can play an important role in fostering green finance. MDBs affirm their commitments towards green investments. In addition, some of them established post-2020 climate-targets, which reveals once more their growing interest in the field. They made some progress regarding those targets while allocating funds for both climate change mitigation and

climate change adaptation. However, the funds directed towards climate change adaptation finance are low compared to those for climate change mitigation. Therefore their share in the total of the MDBs funding should increase. Apart from lending activity, the MDBs have a pioneering role in development green tools and practices, another crucial dimension for green finance development. To this respect, one can mention the EIB role on green bond market.

The activity of the MDBs in Romania in the field of green finance includes providing financing facilities, making investments in green bonds issued by local banks, providing technical assistance. The EIB, the EBRD and the IFC are among the most active MDBs in Romania, contributing to green projects financing in areas such as energy efficiency, clean transportation and green buildings, but our main finding is that green finance in Romania is still limited, requiring increased commitments in this area, including from multilateral development banks.

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Romania's Energy Security in The Context of the European Green Deal Requirements

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Abstract: Presently there is a large consensus stating that while energy security remains key for assuring the consumption needs in Romania, its fulfilment may be achieved through two essential factors: the accessibility of resources and their long term availability. In the current geopolitical context, this paper aims to analyse Romania's energy security considering the aspects regarding the European Green Deal. Therefore, in the first part of the paper, there will be presented the general considerations regarding Romania's energy security and the possibility for Romania to become a regional energy security provider. In the second part of the paper, an analysis will be carried out on the functioning of the national system for the 2023-2024 winter, namely forecasts will be made on energy production and consumption while presenting the necessary measures for the proper functioning of economic operators' activities.

Keywords: energy security, Green Deal, policies, energy efficiency

JEL Classification: Q42, Q47, Q48

1. Introduction

Energy security is a condition of existence, an inalienable and imprescriptible international right, derived from the country's right over its energy resources and from European and Euro-Atlantic treaties that must become one of the long-term governance objectives. Energy security involves ensuring the necessary energy consumption in terms of accessibility to resources while preserving their availability of long-term access.

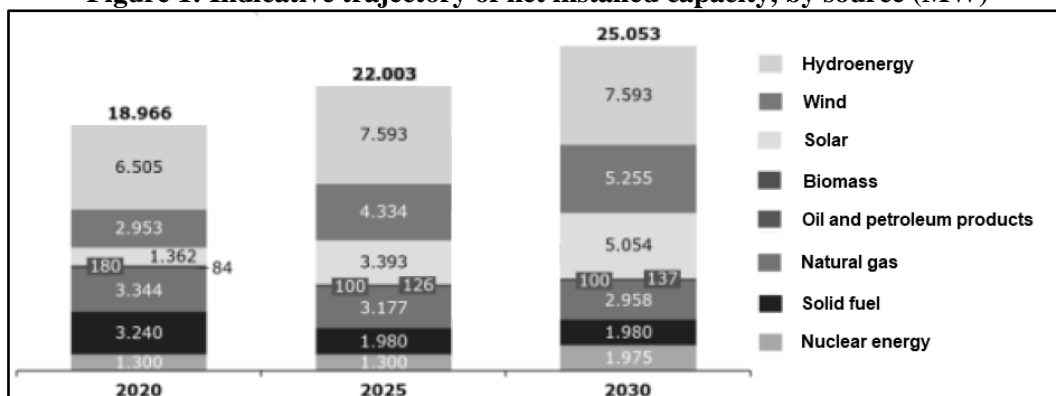
Romania's energy security is linked to the Black Sea, with investment efforts in this area targeting both natural gas production and renewable energy production, especially offshore wind farms. Investment efforts in the Black Sea target both natural gas production and renewable energy production, especially offshore wind farms. The diversification of electricity sources is essential for better integration of renewable energy sources.

Romania is already a regional leader in the renewables sector, ranking 11th in the EU's hierarchy in terms of the share of renewable energy in total consumption (Popa, 2021).

2. Romania's energy security - general considerations

Romania considers the security of energy supply from domestic sources a primary objective for ensuring national energy security (Ministry of Energy, 2022). Romania aims to maintain the current diversified energy mix by 2030, considering both the decarbonization objective of the energy system and ensuring its flexibility and adequacy to the national particularities of the energy system. In this respect, the evolution of installed capacities between 2020 and 2030 is shown in Figure 1.

Figure 1: Indicative trajectory of net installed capacity, by source (MW)



Source: Deloitte calculations based on information provided by the PNIESC (National Integrated Energy and Climate Change Plan) Interinstitutional Working Group and COM recommendations, 2022.

To meet the needs of energy consumption in Romania, the installed capacity will increase by approximately 35% in 2030 compared to 2020, due to the installation of new wind (2,302 MW by 2030) and solar (3,692 MW by 2030) capacities, which will lead to an increase in domestic energy production, thus ensuring a higher degree of energy independence. The positive impact can be seen in the reduction of dependence on imports from third countries, from a level of 20.8% for 2020 to 17.8% in 2030, representing one of the lowest levels of dependence on energy imports in the European Union (Păcuraru, 2022).

It is also planned the replacement of several coal-fired units with combined cycle units powered by natural gas and units based on renewable energy sources, the retrofitting of a nuclear unit, as well as the construction of at least one new nuclear unit by 2030 (Petrescu, 2023).

As far as the gas market is concerned, Romania benefits from its favourable position regarding the transmission capacities in the region and by the possibility of interconnecting the national transmission system (NTS) with the Central European transmission systems and with the gas resources in the Caspian Basin, the Eastern Mediterranean and the Middle East, through the Southern Corridor. For natural gas supply, Romania is specifically considering the development of the National Gas Transmission System on the Bulgaria-Romania-Hungary-Austria corridor (BRUA) and the development on Romania's territory of the Southern Transmission Corridor for taking over natural gas from the Black Sea shore. The existing interconnections will continue to be used in the Northwest direction (Medieșul Aurit), Sud Est (Isaccea) with Ukraine, in the West direction with Hungary, in the South direction with Bulgaria and in the East direction with the Republic of Moldova.

Ensuring the flexibility and adequacy of the national energy system is an important objective for Romania in the field of energy security. To better achieve a diversified energy mix, Romania aims to replace the electricity production capacities that will go out of operation with new, efficient and low-emission capacities, at the level of 2030. Until coal capacities are replaced with new capacities based on low-emission technologies, rehabilitation works and increasing the energy efficiency of existing capacities are envisaged, which will remain in operation for reasons of ensuring Romania's energy security (Tudorache, 2023).

Romania also has targets on encouraging dispatchable consumption to ensure demand response and targets on energy storage. The development and use of the technical and economic potential of renewable energy sources (RES) in the national energy system (NES) depends on the development of storage capacities as well as on the adoption of technologies for the injection of hydrogen in the form of syngas from RES and the use of hydrogen in industrial processes.

To enable the integration of RES into the national energy system, a transition from coal to natural gas-fired capacity will start in 2024, as this fuel has the advantage of allowing flexible operation. This can ensure system balancing, considering the intermittent nature of RES (Pătru, 2022). In this respect, at least 1400 MW of new natural gas-fired capacity is planned to be installed by 2030.

In order to maintain the adequacy of the energy system, currently, the acceptable limits for power generated from wind and photovoltaic sources are strongly conditioned by the level of hydraulicity and thermal regime. Thus, from the point of view of residual power flexibility, the critical times of the year are the hours of high consumption in winter/summer, the hours of thermal minimum/maximum and the hours of extreme hydraulicity (minimum/maximum). There is the need to install additional capacity of at least and 600 MW (additional to 2020) by 2025. Having this in mind, Romanian authorities may consider supporting priority projects in this field, if market mechanisms are not sufficient, through support schemes (including state aid).

3. Romania, regional supplier of energy security

The current international context for energy markets is volatile while the recent technological developments can significantly change the way energy markets operate. In terms of security of energy supply, the development of renewable and low greenhouse gas energy generation capacities will ensure a balanced and diversified energy mix.

Also, by exploiting the hydrocarbon and offshore renewables potential in the Black Sea, Romania can become a regional supplier of energy security. At the same time, strengthening and modernising networks, digitalising, diversifying of sources and supply routes, increasing and modernising storage capacities compatible with the use of new gases and hydrogen, and increasing interconnection capacities with neighbouring countries are factors that will contribute primarily to ensuring national energy security, but also to Romania's objective of becoming a regional energy security supplier.

In this context, there are premises that, through the development of the energy sector, considering the availability of resources and the stability provided by the efficient transition to decarbonisation and the maturity of new technologies, Romania can achieve and consolidate its status as a regional energy security provider.

4. Analysis of national system operation for winter 2023/2024

4.1. Estimating the production/consumption balance of electricity and heat in cogeneration for winter 2023/2024

Estimating gross energy consumption

The monthly average temperatures achieved during November 2022-March 2023 were higher than the multi-year monthly averages over the whole period. The largest deviation from the multi-year average temperature was registered in January (5.1 °C warmer) and the smallest in February (0.9 °C warmer).

Table 1 shows the monthly average temperatures recorded in recent years during the winter months in relation to the standard climatological norm.

Table 1. Monthly average values of temperatures recorded in recent years in the winter months and standard climatological standard (°C)

Standard	Month	2016	2017	2018	2019	2020	2021	2022	2023
3.8	November	3.5	5	4.7	8.7	4.2	5.7	4.6	-
- 0.8	December	- 2	1.5	- 0.8	2.3	2.9	1.1	0	-
- 1.9	January	- 2.3	- 6	0	- 2.1	- 0.7	- 0.1	- 0.8	3.2
- 0.2	February	4.7	0.5	- 0.7	1.5	2.9	1.4	2.1	0.7
4.1	March	3.5	6.9	2.4	6.4	2.6	4.2	2.0	5.5

Source: National Administration of Meteorology, 2023

In 2023, due to high electricity prices combined with the slower growth of the economy, as well as with the production of electricity by prosumers using photovoltaic panels - production that is still difficult to record - the measured gross electricity consumption in the first half of 2023 was down more than 8% compared to the same period last year.

As of May 31st, 2023, the installed capacity of photovoltaic panels of prosumers was 867 MW. Against the background of the increased interest in the installation of photovoltaic panels and the programmes run by the Administration of the Environment Fund, it is estimated that in the winter 2023/2024 new capacities with an installed capacity of about 1500 MW will be commissioned in such power generation facilities. For their production, which is subtracted from the estimated consumption at national level, a load factor like that of photovoltaic power plants for which metering systems are in place has been considered for the winter period.

The evolution of gross electricity consumption in recent years as well as information on consumption values recorded in the winter period 2022/2023 are presented in Table 2 and Table 3.

Table 2. Gross domestic electricity consumption in recent years in winter months (GWh)

Month	2015	2016	2017	2018	2019	2020	2021	2022	2023
January	5551	5630	5896	5671	5819	5593	5625	5536	4893
February	4979	4971	5177	5313	5178	5141	5189	4858	4582
March	5176	5135	5204	5769	5266	5093	5551	5243	4751
November	5019	5258	5277	5340	5091	5237	5142	4621	-
December	5242	5638	5502	5733	5391	5528	5576	4880	-

Source: National Strategy and Forecasting Commission, 2023

Table 3. Consumption values, peak production and realised temperatures for the period: November 1st, 2022 – March 31st, 2023

Month	November 2022	December 2022	January 2023	February 2023	March 2023
Gross domestic electricity consumption (GWh)	4621	4880	4893	4582	4751
Peak consumption (MW)	7848	8250	8285	8354	7776
Average monthly temperature achieved (°C)	6.4	2.3	3.2	0.7	5.5
Multiannual average monthly temperature (°C)	3.8	- 0.8	- 1.9	- 0.2	4.1

Month	November 2022	December 2022	January 2023	February 2023	March 2023
Deviation from climatological standard (°C)	2.6	3.1	5.1	0.9	1.4
Maximum peak output (MW)	8388	8410	9924	9691	8658

Source: National Administration of Meteorology and National Strategy and Forecasting Commission, 2023

For the estimation of the country's gross electricity consumption for the period November 1st, 2023 - March 31st, 2024, the National Energy Dispatcher (NED) considered a medium scenario, with temperatures around the multi-year monthly averages, and a pessimistic scenario, with average monthly temperatures up to 2 °C lower than the multi-year averages (Romanian Government, 2023).

In the medium scenario, for each month from November 2023 to March 2024, assuming temperatures like the multiannual, a positive temperature correction between 2% and 7% was applied for each month, taking as a reference the similar period in winter 2022-2023 when the average seasonal temperature was almost 2.5 °C above the multiannual. About 50-100 GWh representing the estimated production for prosumers in that month was subtracted from the values obtained. Under these conditions, the gross domestic consumption forecast in the average scenario for the period November 1st, 2023 - March 31st, 2024 is 24400 GWh, about 2.8% higher than the value of 23727 GWh recorded in the previous winter.

In the pessimistic scenario, a similar analysis was made, considering for each month average temperatures 1-2 °C lower than the multiannual ones, resulting in a monthly consumption up to 150 GWh higher than in the average scenario. The gross domestic consumption forecast in this scenario for the period 1.11.2023 - 31.03.2024 is 25150 GWh, about 6% higher than the 23727 GWh recorded in the previous winter season.

For the same period, i.e. November 2023 - March 2024, the National Commission for Strategy and Forecasting (NCSP) forecast an average consumption of 23590 GWh, i.e. 0.6% lower than the values recorded in the same period of the previous year. Based on these assumptions, the consumption forecasts are presented in Table 4.

Table 4: Domestic electricity consumption - estimated values - monthly averages (GWh)

Month	November 2023	December 2023	January 2024	February 2024	March 2024
NED forecast medium scenario	4750	5000	5200	4700	4750
NED forecast pessimistic scenario	4900	5150	5350	4850	4900
NCSP forecast	4560	4795	4895	4625	4715
Achieved November 2022- March 2023	4621	4880	4893	4582	4751

Source: National Energy Dispatcher and National Strategy and Forecasting Commission, 2023

Considering the evolution of electricity consumption in recent winter periods and the fact that long-term weather forecasts have a high degree of uncertainty, the production-consumption balance will contain both scenarios analysed by NED, i.e. the medium scenario, in which the forecast gross domestic consumption for the period November 1st, 2023 - March 31st, 2024 is 24400 GWh, about 2.8% higher than the value of 23727 GWh recorded in the previous winter, and the pessimistic scenario in which an increase in consumption to the value of 25150 GWh has been forecast, about 6% higher than the consumption recorded in the winter of 2022-2023.

Electricity exchange balance

Regarding the import/export balance (Table 5), compared to the previous winter season, in the context of a higher estimated consumption, DEN considered an import balance for each month, also starting from the evolution of cross-border exchanges in previous years. In this respect, the monthly values of the import balance were estimated at 100 GWh (a total of 500 GWh) in the moderate scenario and 250 GWh in the pessimistic scenario (a total of about 1250 GWh).

At the same time, NSFC estimated, for the period November 2023 – March 2024, a total export balance of 465 GWh, mentioning that these estimates are subject to risks regarding the evolution of the current geopolitical context and climatic conditions, with limited validity in time.

Table 5 – Export/import exchange balance ("+" import; "-" export), GWh

Institution	Scenario	November 2023	December 2023	January 2024	February 2024	March 2024	Cumulated
NED	Medium scenario	100	100	100	100	100	500
NED	Pessimistic scenario	250	250	250	250	250	1250
NSFC		60	- 55	- 250	- 140	- 80	- 465

Source: National Energy Dispatcher and National Strategy and Forecasting Commission, 2023

Although the exchange balance, as monthly average values, resulting from the production/consumption balance (Table 6) indicates an import for the first three months in the pessimistic scenario, respectively export for the entire period in the moderate scenario, this will not be found on all trading intervals. Compared to the forecast, the level of the exchange balance will vary depending on the conditions of a lower/higher price from outside compared to the price of energy produced in the country, the climatic conditions recorded at regional level, as well as the existence of an increased lack / surplus of offers for the sale of electricity at national level.

The domestic production/domestic consumption balance

Analysing the monthly average estimates and considering the evolution of domestic electricity production in previous winters, it is found that the closure of the production/consumption balance will be directly influenced by renewable productions and that, in special weather conditions (blizzard, soil drought, extremely cold temperatures, etc.), there will be periods of non-coverage of electricity consumption peaks in domestic production.

Table 6: Electricity production/consumption balance

Gross electricity production and consumption	Gross electricity production and consumption Forecast of monthly average values for the period November 1 st , 2023 to March 31 st , 2024						
	Measure Unit	November 2023	December 2023	January 2024	February 2024	March 2024	Cumulated
Total forecasted production of the national system	thousand MWh	4814	5064	5202	4950	5332	25365
	MW	6686	6807	6992	7113	7167	6953
Gross country consumption - mild scenario	thousand MWh	4750	5000	5200	4700	4750	24400
	MW	6597	6720	6989	6752	6384	6688
Gross country consumption pessimistic scenario	thousand MWh	4900	5150	5350	4850	4900	25150
	MW	6805	6922	7190	6968	6586	6894
Consumption coverage from domestic production - moderate scenario	thousand MWh	64	64	2	250	582	965
	MW	89	87	2	360	783	264

Consumption coverage from domestic production - pessimistic scenario	thousand MWh	-85	-85	-147	100	432	215
	MW	-118	-114	-198	144	581	59

Source: National Strategy and Forecasting Commission, 2023

At the same time, unlike in previous periods analysed, due to the sharp decline in consumption, if this trend continues, import values and potential periods of non-coverage of consumption peaks could be lower than those estimated in previous years.

4.2. Measures for the proper performance of economic operators' activities between November 1st, 2023 and March 31st, 2024

The electricity balance (production/consumption), the production of heat produced in cogeneration, fuel purchases and stocks, as well as the volumes of water in large hydropower developments are elements of an indicative scenario that may be adjusted depending on the requirements of ensuring the operational security and operational stability of the national electricity system, the climate changes recorded, and in accordance with the monthly programmes for the exploitation of the main reservoirs, in accordance with the situations which may arise.

To ensure a sufficiently high level of certainty in covering the load curve of the national system, even when boundary situations arise according to the scenarios assessed by NED, the transmission system operator considers it necessary to carry out measures and actions to prepare and monitor the functioning of the national system, as follows (Romanian Government, 2023):

1. Ensuring in advance, at the level of all electricity producers, the quantities of primary energy resources to ensure the supply of electricity to consumption, as well as the reserves necessary to cover imbalances generated by subcontracting on electricity markets, accidental outages of energy groups, malfunctions generated by special weather conditions, increases in consumption above estimated values, etc., respectively for electricity supply to the Republic of Moldova, if the energy situation in the area requires it;
2. Establishing supplies of safety fuel in coal-fired power plants;
3. Ensuring a minimum energy supply in lakes attached to hydroelectric power plants;
4. Maintaining institutional coordination and collaboration between all entities involved in ensuring measures regarding the safety level in operation of the national electricity system and in achieving safety supplies;
5. Ensuring gas supply to gas-fired power plants even in extreme weather conditions (frost);
6. Storing natural gas to at least 90% of the storage capacity;
7. Compliance with the schedule for achieving coal, natural gas and water supplies by the start of the 2023-2024 winter season;
8. Carrying out the maintenance programme in the power plants to ensure the highest possible availability, so that in the event of a malfunction of the power units in operation, they can be replaced by power units in reserve;
9. To make available and carry out maintenance works on the energy groups in order to operate during the winter season TA5 - 105 MW and TA6 - 105 MW CET Brazi and TA1 - 50 MW CET Arad;
10. Ensuring the operation of centralised heating systems in terms of maintenance and fuel supply, in order to reduce the consumption of energy resources at the level of administrative units and to avoid an increase in the consumption of electricity and natural gas as a result of substituting thermal energy with electricity or natural gas;
11. The provision of technical and organisational measures for the providers, in cooperation with local authorities, to ensure the operation of land transport infrastructure during winter under conditions as close as possible to normal, particularly during periods of difficult/extreme weather;
12. Increasing the volume of electricity contracted on a medium and long-term basis to supply consumers, in order to reduce the volume of electricity purchased on the market for the following day;
13. Carrying out the maintenance programme of the electricity transmission network and of the electricity distribution network in order to avoid the problems of the power plants or the reduction of availability of power plants due to unavailability of electricity networks;
14. Moving from provisional to definitive design solutions for transmission and distribution grids, possibly with reinforcements and design upgrades where appropriate, to reduce the risk of incidents;
15. Providing maintenance and intervention teams for all entities in the electricity and gas systems to repair the malfunctions;

16. Ensuring sufficient storage of materials and components for the repair/replacement of faults occurring in energy installations so that the repair time is as short as possible;
17. Ensuring rapid access to energy installations for intervention teams through the Emergency Command Center;
18. Providing diesel generators for supplying vulnerable consumers, energy installation aggregates to avoid interruption of natural gas and oil extraction, fuel transport through pipelines, internal services of power plants;
19. In situations of regional or European energy crisis, the decommissioning and use of TA7 Turceni by activating the provisions of Emergency Ordinance no. 108/2022 on decarbonisation of the energy sector;
20. Activating the measures of the Emergency Plan for the security of natural gas supply in Romania, in the event of the occurrence of natural gas supply crises.

5. Conclusion

If the year 2022 was the year of energy investments in Romania, the year 2023 continues to be a year of massive investments and the effects of this investments will soon to be seen. At the same time, the Ministry of Energy has signed strong, long-term, strategic partnerships to ensure the country's energy security.

Regarding energy security and reducing the dependence on Russian gas, strong, long-term, strategic partnerships have been concluded to secure natural gas needs for both previous and upcoming cold seasons.

As far as electricity is concerned, the most important pillar is the nuclear one. Units 3 and 4 at Cernavodă, together with the small modular reactor from Doicești, will make the nuclear sector a major part of the energy mix. In connection with this sector, long-term strategic partnerships and relationships have been established with NATO member states and European partners. The integrated nuclear circuit within Nuclearelectrica has been secured and the prerequisites have been created for this sector to be the driving force in the production of clean electricity with zero greenhouse gas emissions in Romania for decades to come.

Nuclearelectrica SA selected the company Candu Energy Inc., member of SNC-Lavalin Group, to carry out additional pre-project works for the CANDU reactor of Cernavodă Unit 1, before extending its lifespan. Under the two-year agreement, worth approximately USD 65 million, SNC-Lavalin will perform long-term engineering and front-end engineering services, in preparation for the future refurbishment project of Cernavodă NPP Unit 1. The refurbishment will extend the operational life of the Unit 1 reactor by another 30 years, until 2060. Starting with 2029, through the refurbishment of Unit 1, approximately 5.5 million MWh of clean, affordable energy will be delivered annually to the national energy system (NES), and over 5 million tons of CO₂ will be avoided annually for another 30 years.

We must also mention the large investments in new electricity production capacities on natural gas, such as the mammoth investment that will be carried out by the private investor who bought the Mintia Power Plant and which will install a power of 1.7 GWh there, using the latest technology in the field. It is not the only investment of its kind – electricity production on natural gas, but it is by far the largest. It is a private investment worth 1.5 billion euro, which represents a record value for an electricity production capacity in Romania. It is also worth mentioning the major investments that will be made at the Oltenia Energy Complex from the Modernization Fund. These are 8 projects submitted by the CEO to produce energy from renewable sources, totalling 670.8 million euro, of which 469.5 million euro from the Modernization Fund. Upon completion, the total production will be 735 MWh. Next, we need to discuss the power installed through the programs that are run through the NRRPs, which means another 1GWh.

Another example of partnership is the submarine cable. The governments of Azerbaijan, Georgia, Hungary and Romania signed a Strategic Partnership Agreement on Green Energy Development and Transport in Bucharest. This document represents the basis of the financial and technical framework for the implementation of the submarine cable project for the transmission of electricity from renewable sources between Romania and Azerbaijan via Georgia and the Black Sea, and subsequently for the transmission of this energy to Hungary and the rest of Europe via the European transmission system. Romania plans to operate a green electricity transmission cable along the Tuzla-Podișor route, then along the BRUA¹ gas pipeline corridor, to provide a link from east to west Romania. This agreement is based on the interests of the four countries in strengthening national and regional energy security and connectivity in the Black Sea basin, diversifying sources of supply, exploiting the potential for renewable energy production in the Caspian region and increasing the share of renewable energy in the national energy mix. Romania is interconnected in terms of gas infrastructure - gas import/export (reverse flow) with all countries in the region. These are Hungary, Bulgaria, Moldova and Ukraine. This means that gas

¹ The BRUA pipeline is a natural gas pipeline from [Podisor](#), Giurgiu County to [Recas](#), Timiș County and a part of the future Bulgaria, Romania, Hungary and Austria gas interconnector.

can come into Romania either through the Vertical Corridor, the Transbalkan Corridor or the BRUA. This gives access to gas from the Caspian Sea, but also to liquefied natural gas from LNG terminals in Turkey or Greece.

Our main finding is that for Romania, in real terms, energy independence from Russian gas is achieved through diversification of supply sources, while the country remains a true champion of the renewable energy in the EU.

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Key Aspects Regarding the Recovery and Resilience Facility: Priorities, Risks and Perspectives

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Abstract: The main objective of this paper focuses on the analysis of the Recovery and Resilience Facility from the standpoint of general priorities and risks associated to less funds available for the Member States which are not able to accomplish some of their assumed milestones and targets. High shares of the total value of National Recovery and Resilience Plans are foreseen for the green and digital transitions. Health, education and social sectors, together with institutional development are also taken into account, however these are incomparably lower funded. In the literature are criticized, among others, the strings attached to the disbursements, neglect of social implications, uneven regional distribution, difficulty to implement judicial or pension reform. Changes of the initial plans have been possible, as several countries have already submitted substantially changed plans, in terms of amounts, and/or targets. The European Commission has endorsed them, based on justified "objective circumstances". In spite of all risks and weaknesses, the NRRPs prompt economic recovery and reforms in the EU Member States, in line with the EU's goals and objectives.

Keywords: National Recovery and Resilience Plans, NRRPs, Recovery and Resilience Facility, RRF, milestones and targets, REPowerEU, green transition, digital transformation

JEL codes: E61, F36, R10, R58.

1 Plans to stimulate economic recovery and reforms in the EU Member States¹

The Recovery and Resilience Facility (RRF), as the “centrepiece of the NextGenerationEU”, is a temporary instrument set up by Regulation (EU) 2021/241 and fine-tuned by Regulation (EU) 2023/435 in order to make EU Member States’ economies and societies “more sustainable, resilient and prepared for the green and digital transitions” (European Commission, n.d.). Through the Facility, the Commission raises funds by issuing bonds on behalf of the EU. Every Member State has to dedicate at least 37% of the total value of its National Recovery and Resilience Plan (NRRP) to climate-relevant investments and reforms. The target has already been exceeded, with the foreseen climate expenditure now surpassing 40%. At the same time, the reforms and investments that support digital objectives in Member States’ NRRPs are supposed to be at least 20% of total allocation set in the RRF, level already surpassed by 6 percentage points (European Commission, 2023) and even more if one takes into account the REPowerEU chapters.

The RRF is widely seen in the literature as a post-COVID-19 EU reconstruction programme (Picek, 2020) and a short-term Keynesian stimulus (Pisani-Ferry, 2020). Its main goal is to foster structural transformation, especially in less-advanced Member States and those harder-hit by crisis (Pisani-Ferry, 2020). One significant objective is to diversify gas supplies and accelerate the pace of reducing dependence on fossil fuels, in favour of more renewable energy in the energy mix. The intention is to phase out Russian fossil fuel supplies, as underscored by the Communication of May 18, 2022. On this basis, REPowerEU entails additional investment of EUR 210 billion between 2022 and 2027. It supports the European Commission’s goal of achieving at least -55 % net greenhouse gas emissions by 2030 and climate neutrality by 2050 in line with the European Green Deal (European Commission, 2022).

The RRF is implemented under direct management by the Commission, but relies on the Member States for compliance with national and EU rules, as in shared management. The measures in the NRRPs have to be implemented by the end of 2026 (Lilyanova, 2023).

¹ The paper was presented at the trilateral Roundtable *Adjustment of the CEE Economies to Long-Term Challenges and Overlapping Crises*, organized online by the Institute for World Economy, Romanian Academy, November 9, 2023.

Priorities established in NRRPs are in line with the EU’s goals and objectives alongside six pillars, namely: green transition, digital transformation, smart-sustainable-inclusive growth, social and territorial cohesion, health-economic-social-institutional resilience and policies for the next generation (European Commission, 2023). However they are adapted to the Member States’ own particularities in terms of labour market, the state of public finances, ability to maintain a sustainable growth rate (based on productivity and growth factors) (Martinez Mongay et al., 2022) and also in terms of capacity to implement the green and digital transitions.

According to the RRF Regulation, Member States have to report twice a year in the context of the European Semester on the progress made in the implementation of their NRRPs, with the deadlines for the bi-annual reporting at no later than by 30 April and 15 October (European Commission, 2023).

The RRF is performance-based (it has a *performance conditionality regime*): its focus is on achieving certain milestones and targets (M&T) rather than on the costs themselves, unlike traditional spending programmes (Lilyanova, 2023).

Most of the M&T are defined in terms of policy outputs (e.g., the entry into force of a legislation, the creation of a new administrative structure, digitalising a process). The majority of reforms are sector-specific, aimed to enhance the effectiveness of the intended investment in the sector (e.g., reform of the health care system complementing investments in health facilities or services, reform of the electricity sector to facilitate the integration of renewables in the grid). However, the largest NRRPs also include major horizontal reforms in key policy areas (public administration, justice, tax policy, pension systems, labour market policies) (Rubio, 2022).

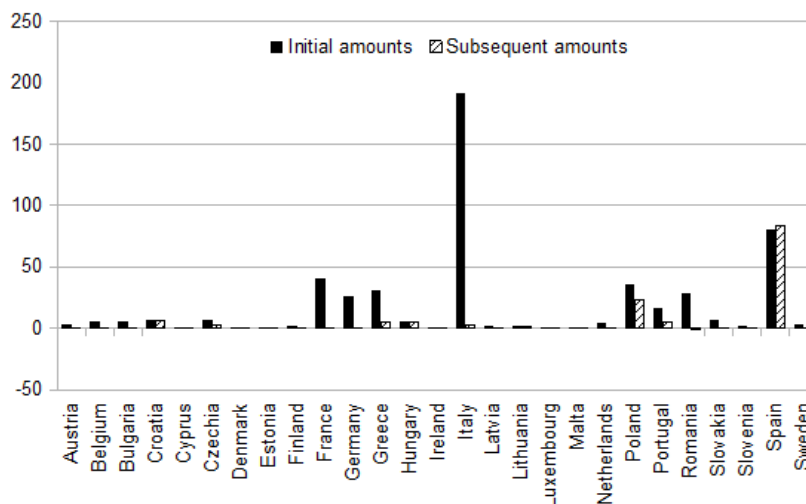
Comparisons between national plans are considered in the literature as “challenging”, “because they present data in very different structures. The number and definition of headline categories and the availability of summary information about sub-categories varies from country to country. Nevertheless, the biggest challenge of cross-country comparison is the definition of non-overlapping spending categories, because a particular investment could support various purposes... for example green, social and inclusive growth as well as policies for the next generation” (Darvas *et al.*, 2023).

2 Key data related to NRRPs

The total RRF amount is of EUR 723.8 billion at 2022 prices, of which EUR 385.8 billion in loans and EUR 338 billion in grants. More than the half of the EU Members have originally chosen the option of no allocation of loans. Not only large countries, with the ability to borrow at low interest rates (Germany, France, Spain), but also smaller ones - Austria, Benelux countries, Ireland, Nordic countries, Baltic States, Bulgaria, Croatia, Hungary, Czech Republic, Slovakia, Malta - have *initially* opted only for grants. Subsequently, several of these Member States have required also loans.

According to the original plans, the highest amount was that foreseen for Italy (EUR 191 billion, 26% of the total RRF), followed at distance by Spain (EUR 69.5 billion, 9.6%), France (EUR 40.3 billion, 5.6%), Poland (EUR 35.4 billion, 4.9%), Greece (EUR 30.5 billion, 4.2%), Romania (EUR 29.2 billion, 4%) and Germany (EUR 26.4 billion, 3.6%) (Chart 1). These taken together concentrated circa 60% of the total RRF. For Poland, the loans represented only 1/3 of the total allocation, for Greece 42%, while for Romania 51%.

Chart 1: Initial and new amounts of NRRPs by country, including REPowerEU (EUR billion)



Notes: For Bulgaria, the modified version of its RRP reflects the amount of **EUR 5.7 billion** in grants instead of the initial EUR 6.3 billion. The revision is part of the June 2022 update to the RRF grants allocation key and reflects Bulgaria's comparatively better economic outcome in 2020 and 2021 than initially foreseen. Similar reductions are recorded also by Croatia, Cyprus, France etc. For other countries, such as the Czech Republic, one can remark the upward revision of its maximum RRF grant allocation, as a result of the June 2022 update to the RRF grants allocation key, which and reflects the Czech Republic's comparatively worse economic outcome in 2020 and 2021 than initially projected. There are mentioned other factors such as: supply chain disruptions; the increased costs of construction due to higher costs for raw materials; the high inflation experienced in 2022 and 2023, which affected the costs of public procurement. Source: Own representation based on European Commission (2023b; 2023c; 2023d; 2023e).

In the initial form, the funds as a share of GDP varied between 1% and 17%, the largest share being that of Greece (17%), followed by Romania (12%), Croatia and Italy (11%), Bulgaria (9%) and Portugal (almost 8%).

It is worth noting that the amounts are not allocated according to GDP or population. For 70% of the total amount available in grants, the allocation takes into account the Member State's population, the inverse of its GDP per capita, and its average unemployment rate during 2015-2019, always compared to the EU average. For the remaining 30%, the formula replaces the 2015-2019 unemployment rate indicator by the observed loss in real GDP over 2020 and the observed cumulative loss in real GDP over the period 2020-2021. As regards loans, their maximum value for each Member State cannot exceed 6.8% of its Gross National Income. However, an increase is possible "in exceptional circumstances subject to available resources" (European Commission, 2020).

Several countries have submitted substantially changed plans, in terms of amounts, and/or targets. One relevant example is that of *Spain*. The European Commission approved the country's request for EUR 83 billion in relief loans and RePowerEU financing. As regards grants, it will receive an additional EUR 7.7 billion after a recalculation, plus other EUR 2.6 billion to offset the energy price shock in the wake of Russia's invasion of Ukraine. As many as 52 changes to the initial draft in the face "objective circumstances" have been accepted. Spain will not implement any more a pay-as-you-go system for motorway use as a disincentive for polluting transport, and Madrid has now committed instead to boosting rail freight transport. It is worth noting that "Spain had been unable to achieve some of its milestones and reforms due to early elections in July and that inflation and supply chain disruptions have altered some targets". Spain is one of the most advanced in terms of RRF Payment Progress, as it has already received EUR 37 billion in the first three approved payments.

Another significant case in point is that of *Poland*. Its **changes** to the original plan endorsed by the Commission on November 21, 2023, are based on the need to factor in, among others, "objective circumstances hindering the fulfilment of certain measures as originally planned, including the high inflation experienced in 2022 and 2023 and supply chain disruptions caused by Russia's war of aggression against Ukraine" and "the request to take up an additional **EUR 23 billion** in available RRF loans". The foreseen amounts are: EUR 22.5 billion RRF, EUR 2.8 billion REPowerEU grants allocation and EUR 34.5 billion in RRF loans (EUR 23 billion new RRF loans and EUR 11.5 billion in loans in the original plan), totalling EUR 59.8 billion (European Commission, 2023c).

Also on November 21, 2023, the European Commission endorsed *Greece's* modified RRP, which includes a REPowerEU chapter. It was accepted **the request to take up EUR 5 billion in available RRF loans and incorporate EUR 768 million in additional RRF grants under REPowerEU.** In addition, Greece has proposed several changes to its original plan. In particular, the modified plan includes **four newly added or enhanced reforms** in the areas of primary healthcare, combating tax evasion, property rights and the financial sector. The modified plan also includes **four new investments**, three of which are underpinned by the need to factor in the damage caused by the catastrophic wildfires and floods that hit Greece in August and September 2023" (European Commission, 2023d).

The above-mentioned case studies underscore that significant changes in the initial NRRPs have been possible due to the Commission's acceptance of their necessity, based on justified "objective circumstances".

3 Risks and perspectives

One of the most quoted risks mentioned in the literature is the failure to meet M&T, associated to less funds available for the Member States which are not able to accomplish some of their M&T.

The number of M&T attached to each national NRRP is very large. Progress towards the fulfilment of an action (an investment project or a reform) is measured through various intermediate and final milestones and targets. It ranges from 70-100 for the smallest NRRPs to 300-500 for the largest ones (the Spanish, Greek and Italian NRRPs) (Rubio, 2022). It is well-known that no funds are allocated to the Member States for M&T that have not been satisfactorily fulfilled (European Commission, 2023).

The risk of non-disbursement is also mentioned by Corti and Ruiz de la Ossa (2023). The authors point also to the limits of the M&T system to monitor RRF investments: it is possible for a country to be compliant with the indicators agreed with the Commission, but this does not ensure objectives such as reducing regional and local inequalities. “While this will not affect the RRF disbursements, it certainly risks hampering the measures’ effectiveness and ultimately disappointing (and possibly angering) those citizens that have been patiently waiting for these promised new services. To be clear, the M&T arrangement currently in place formally works but it falls far short in meeting the requirements and expectations of performance budgeting” (p. 5).

M&T are described in detail and the possibilities to revise them are very limited. Any modification requires a qualified majority vote by the Council and is only accepted in case relevant milestones and targets are no longer achievable, either partially or totally, due to “objective circumstances” (Rubio, 2022).

The conditional financial support has been intensely criticized in the literature, in terms of “harming democratic standards and social rights”. However, RRF advocates for investment and reform, instead of an austerity approach (Bekker, 2021).

In the literature have been also underlined weaknesses in the social policy area. For instance the Slovak plan “is exclusively focused on healthcare, without providing relevant reforms to properly address the high risk of poverty or social exclusion, the high level of inequality and the limited access to social protection for some population groups” (Corti et al., 2021). Hacker (2022) points that “the process of transforming the German economy structurally to be greener and more digitalised” has “neglected the social implications”.

The Romanian plan has been described as “extremely ambitious”, “well written and articulated”, and “it seems to correctly identify the critical points of the Romanian economy and society and to address them precisely”. Nevertheless, the main challenge for Romania, seems to be the implementation of the plan: “The current political situation, as well as Romania’s history as a late absorber of European funds, may give rise to a certain scepticism” (Dimitriu, 2022). For Poland, Florczak *et al.* (2022) emphasize that the disbursement of funds for implementing the relevant objectives is subject to meeting conditions related to reform of the judicial system. In Slovenia’s case, “proposed projects do not take uneven regional distribution sufficiently into account” (Domadenik Muren & Franca, 2022).

It is evident that the RRF has contributed to a supplementary complicated EU governance architecture, and it remains to be seen whether it will lead to a fairer society (Menegatti & Rainone, 2022).

4 Conclusions

The main goal of the NRRPs is to stimulate the twin transition, green and digital. Other goals refer also to health, education, social issues. The green transition is seen as the most important one, as reflected by its current shares in the total programs of various Member States. It supports the objective to make the EU independent from Russian fossil fuels well before 2030. Most of the modified plans have a stronger focus on green transition, as highlighted by higher shares of allocations for climate objectives.

The amounts allocated to each country, as well as the share of grants in the NRRPs vary considerably among the EU Member States. One can remark a high concentration of funds in several countries and also an inclination of several countries to reject loans and access only grants.

The strings attached to the disbursement of funds have been intensely criticized in the literature, however there is no conditionality related to the austerity approach. In spite of all risks and weaknesses, the NRRPs prompt economic recovery and reforms in the EU Member States, in line with the EU’s goals and objectives.

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The Shattered Cooperation: The European Union – Russian Federation Energy Trade Under the Shadow Of Sanctions

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Abstract: The regional conflict from Ukraine that emerged a year ago, in February 2022, has quickly evolved into a widespread economic confrontation between the West and the Russian Federation, due to the enormous amount of sanctions imposed to the latest as a retaliation for the unprovoked military invasion into the territory of an independent and sovereign state. While the Western sanctions have targeted various economic field (from finance, to energy and trade), for the purpose of this paper we have chosen to analyse the impact of the trade sanctions in the energy field while highlighting how the European Union (EU)-Russia energy trade has shrunk under the sanctions blow. This paper provides an in depth quantitative analysis of the bilateral trade between the two parties, focusing on the evolution of energy trade after the imposition of sanctions. The methodological approach uses the latest Eurostat statistics but also a qualitative analysis of the studied literature in the field to underline the huge impact of sanctions on the bilateral cooperation between EU and Russian Federation. Our main finding shows that the sanctions have seriously affected the economic cooperation between EU and Russian Federation, causing a major decrease of the bilateral trade, but the energy trade still remains important, as the enforced bans have not completely stopped the unwanted energy link between the two parties.

Keywords: EU, Russia, sanctions, the war in Ukraine, energy trade

JEL Classification: F00, F1, F13, F5, F50, F51

1 Introduction and a short literature review

The war in Ukraine has emerged in a very complicated global outlook, still heavily affected by the economic turmoil that characterized the global markets in the post-pandemic international environment. There are many recent studies (Chowdhury et al., 2023; Guenette et al., 2022; Kammer et al., 2022; Khudaykulova et al., 2022; Vadén et al., 2023) pointing out that although it started as a regional conflict between two neighbouring countries, the war in Ukraine has quickly turned into a massive economic confrontation between the world's most powerful Western states and the Russian autarchic and dictatorial regime. While many states, Russian federation included, struggles to return to economic growth, the outburst of this regional conflict during the first month of 2022 has triggered massive shock waves to the global economy. The rapid imposition of sanctions against Russia has led to important consequences not only in the fields targeted by sanctions, but also on the global value chains (GVC) especially because the various restrictions have created bottlenecks for the regional trade flows with widespread consequences for the economies of the all Member States. As some analysts have shown since the ending of the WWII the sanctions against Russia are the harshest and most numerous imposed to a state (Khudaykulova et al., 2022), other studies (Siddi, a, 2022; Mbah, & Wasum, 2022; Žuk&Žuk, 2022) have highlighted the possible boomerang effect of those sanction on the EU's economy in general, and on EU's energetic security in particular.

The EU's sanctions have been enforced through many packages during 2022 and 2023 and have gradually increased in intensity.

It is not the purpose of this paper to discuss all the imposed sanctions as we mainly focus on the energy trade sector, but, it should be mentioned, that the sanctions have led to an important decrease on bilateral trade due to the numerous bans on technological imports of dual goods (that may also be used for military purposes), gold, gems, steel, coal but also because of the impact of financial sanctions on trade transactions (notably as the SWIFT exclusion for the most important Russian banks have significantly affected the flows of international transaction for the Russian economy).

The most important fields of sanctions were: energy, finance, trade and transport (see Box 1), while the energy sanctions were the most significant in terms of economic impact for both parties.

Box 1: A general overview of EU’s sanctions against Russia during 2022–2023

Field of sanctions	Most significant measures	Consequences
Energy	<i>Oil ban and oil price cap</i>	The oil ban prohibits the purchase, import or transfer of seaborne crude oil and certain petroleum products from Russia to the EU. The ban apply from 5 December 2022 for crude oil and from 5 February 2023 for other refined petroleum products. The oil price cap applies to seaborne crude oil, petroleum oils and oils obtained from bituminous minerals which originate in or are exported from Russia. The price cap is set at USD 60 per barrel for crude oil, at USD 45 per barrel for discounted petroleum products and at USD 100 per barrel for premium petroleum products.
Finance	<i>SWIFT exclusion and other targeted sanctions for important Russian banks</i>	The SWIFT ban prevents ten Russian and four Belarusian banks from making or receiving international payments using this service. Additional sanctions were imposed to the Bank of Russia.
Trade	<i>Various imports and exports bans</i>	There are various goods involved from steal, to coal and gold, but there are no sanctions on Russian exports of food to global markets. Anyone can operate, buy, transport, and ensure food and fertilisers coming out of Russian Federation.
Transport	<i>Road transport, maritime transport and aviation sector</i>	The road transport ban prohibited Russian and Belarusian road transport operators from entering the EU, including for goods in transit. The maritime transport ban closed EU’s ports to Russia’s entire merchant fleet of over 2 800 vessels (with some exceptions as for instance pharmaceutical and other essential goods). The aviation sector sanctions prohibit access to EU airports for Russian carriers of all kinds and banned them from overflying EU airspace.

Source: Author’s synthesis based on studied literature and on EU’s data about the sanctions, available at: <https://www.consilium.europa.eu/en/policies/sanctions/restrictive-measures-against-russia-over-ukraine/sanctions-against-russia-explained/>

Prior to the sanctions, the energy trade was considered (Siddi, b, 2022; Chen et al., 2023) the backbone of economic cooperation between EU and Russia and was also the main source for EU’s trade deficit with Russia. However, as we are about to show in the following section of this paper, the sanctions have become a massive game changer in the dynamic of the energy trade, hence leading to a gradual diminishing of the bilateral trade between the two parties. Although the frozen cooperation is now more clearly revealed than ever (Yıldız, 2023), the unwanted symbiosis still remains (Andrei, 2022), at least in the natural gas trade since a replacement with other partners is difficult for both EU and Russian Federation as we are about to highlight later in our analysis.

2 Methodology

Our research design is a mixed one focusing on a both quantitative and qualitative analysis. The quantitative analysis is based on the latest Eurostat data on bilateral trade (that stop on the first semester of 2023), while the qualitative analysis focuses on a synthetic overview of EU's many initiatives to reduce its the energy dependence from the Russian Federation. The limitations of the current research are linked mainly of two factors: on the one hand we do not have access on data from the second part of 2023 and, on the other hand, since there is an ongoing conflict, new sanctions could emerge, hence furthering affecting the energy trade. To overcome these limitations we propose a continuation of the current research, after more data will be available, to provide a more in depth and complex analysis of the evolution of the EU-Russian Federation energy trade under the shadow of sanctions.

3 The EU – Russia energy trade: the current status-quo and future perspectives

To better understand how the sanctions have affected the bilateral energy trade we aim to present a brief historical analysis focused on the EU's road to increased energy dependence from Russian Federation, while a second part of this section will highlight the current status-quo and possible perspectives. Hence, our quantitative analysis is divided in two frames: before and after 2022, to better understand how Russia's position has shifted on the European scene from a reliable partner to an unwanted, but still needed energy supplier.

3.1. From friends to enemies: A brief history of the EU - Russian Federation energy cooperation

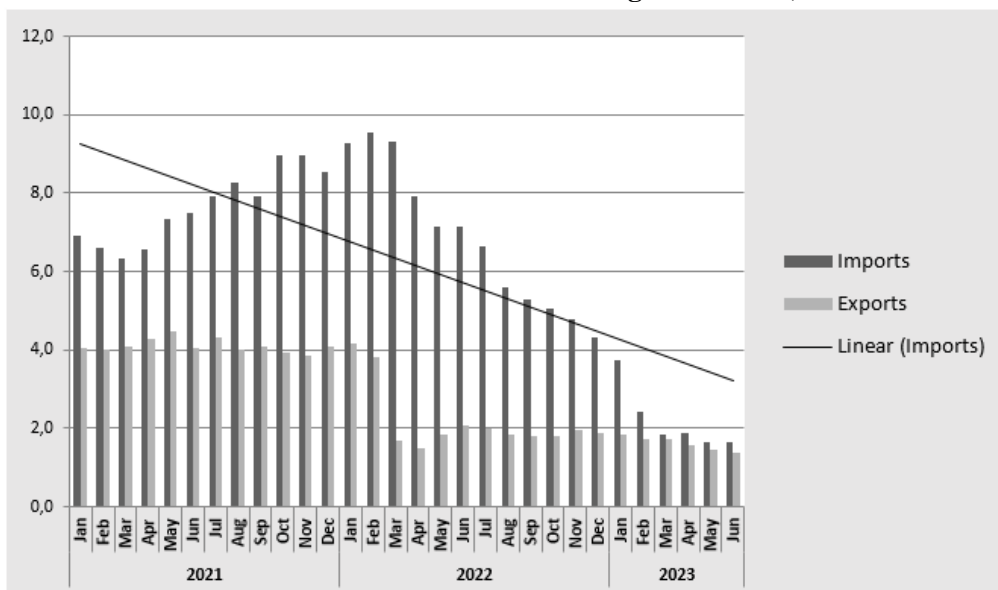
In the decades after the end of the Cold War, trade with the Russian Federation was a mainstay of the EU economy. Until the outbreak of the Crimean crisis (2014), the Russian Federation was of the most important partners for EU, while the cornerstone of this partnership was the European energy imports from Russia.

The EU-Russian cooperation after the soviet collapse started with a great optimism as many analyses viewed the opportunity for a mutual advantageous relation with the former communist country (Shleifer & Treisman, 2005; Lee & Connolly, 2016) hence mistakably confusing the pragmatic approach of Russian authorities with a genuine desire to reform and engage on the road to democracy.

It is important to state that although some sanctions were already enforced after the Crimean crisis, considered by some analyses as a major game changer for the global world order (Moagăr-Poladian & Drăgoi, 2015), the previous sanctions (prior 2022) have not targeted the energy sector, hence the cooperation in this field continued. Moreover, some countries, like for instance Germany even deepened their energy dependence from Russia (prior to the Ukrainian war Nord Stream 2 was build and was ready to de used, but after the new sanctions its launch was postponed).

After the pandemic, when the energy consume diminished because of the restrictions and lockdown, the EU Russia energy trade has picked up in the second half of 2021. However, trade with Russia eventually slowed down, under the shadow of sanctions, especially after the massive wave of sanctions imposed during 2022 (Graph 1).

Graph 1: The evolution of EU-Russian Federation trade during 2021-2023 (% share in extra-EU trade)



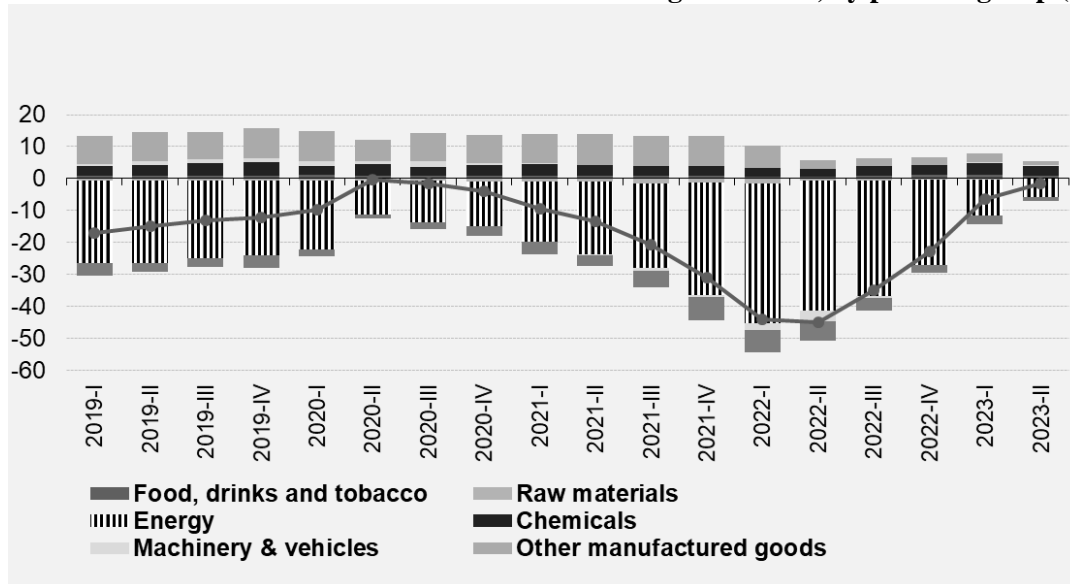
Source: Author representation, based on Eurostat data (2023).

As we may see in Graph 1, the linear trend of the EU's imports from Russia has sharply declined starting with the second half of 2022, mainly due to the numerous energy bans enforced by the sanction regime.

3.2. The current status-quo

As mentioned before in our analysis, the global energy trade between the two parties shrunken under the many sanctions imposed. If we analyse the evolution of EU – Russian Federation trade by product group, we may see that the energy is still dominant among the traded goods, although there is a visible a linear decrease after the sanctions imposition (in 2022).

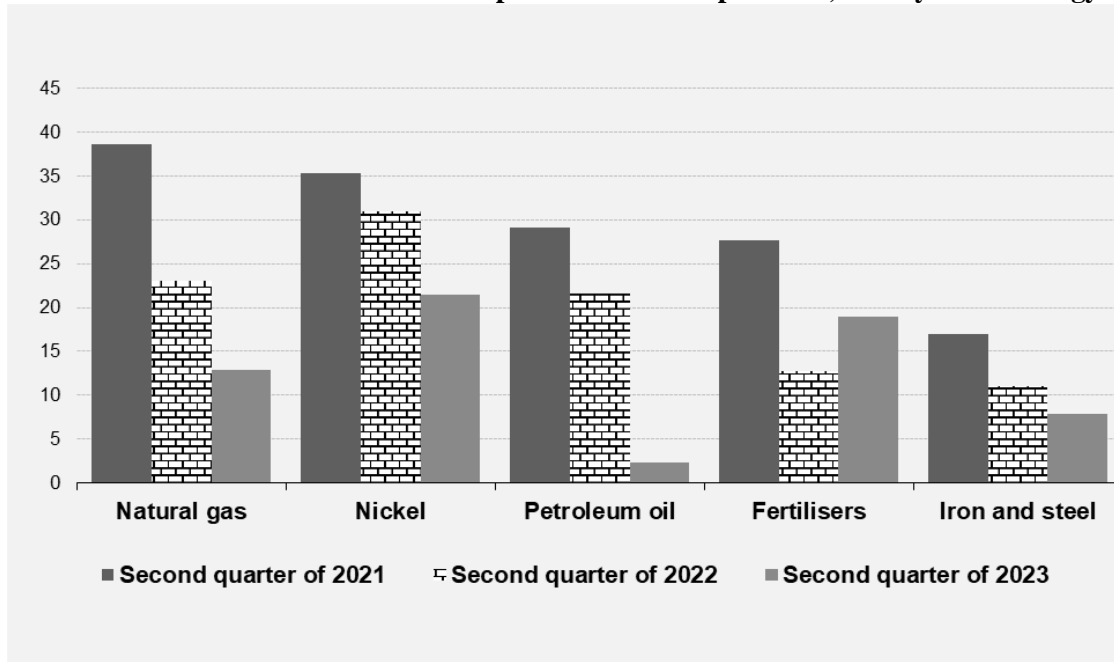
Graph 2: The evolution of EU-Russian Federation trade during 2019-2023, by product group (EUR bn.)



Source: Author representation, based on Eurostat data (2023).

Moreover when we look at the types of energy imports, one may see that Russian Federations still holds an important place as energy supplier, despite the sanctions, especially in the field of natural gas (Graph 3).

Graph 3: Russian Federation's share in EU imports for selected products, mainly in the energy field (%)

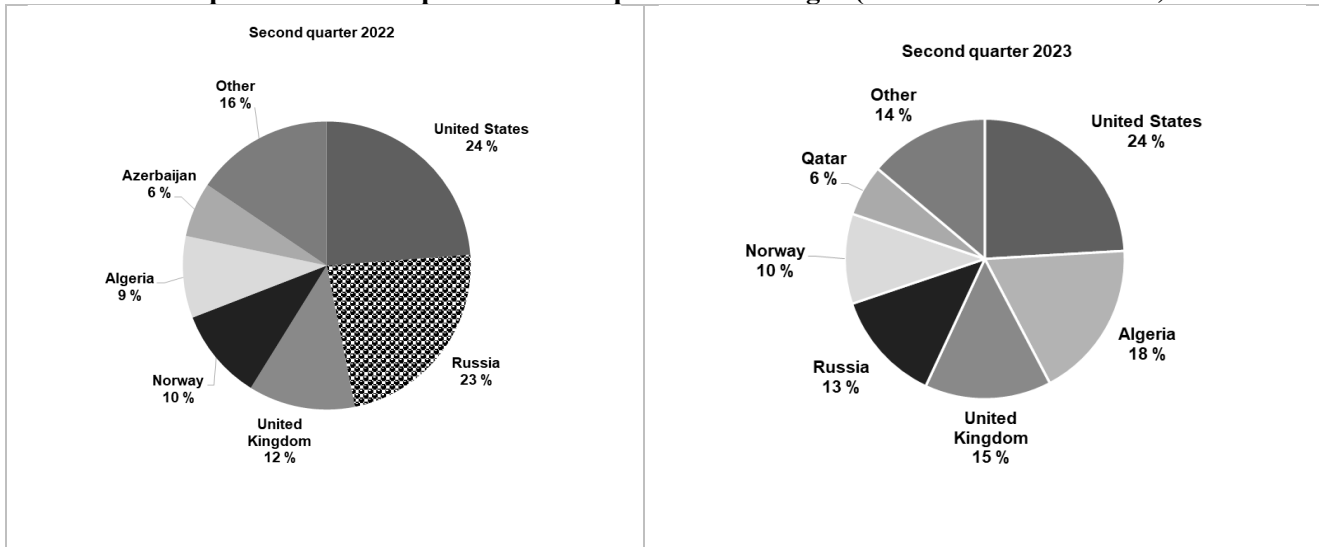


Source: Author representation, based on Eurostat data (2023).

As the Graph 3 is depicting the sharpest decrease registered in the second quarter of 2023 after all the entry bans were enforced, while for the fertilisers we may see an increase as those goods are not under the sanctions ban.

Even if the natural gas imports from Russian Federations decreased in the second quarter of 2023, compared with the second quarter of 2022 and the second quarter of 2021, even in the second quarter of 2023, Russia is still one of the EU’s main suppliers in the field (see Graph 4).

Graph 4: EU’s main partners for import of natural gas (% from extra EU trade)

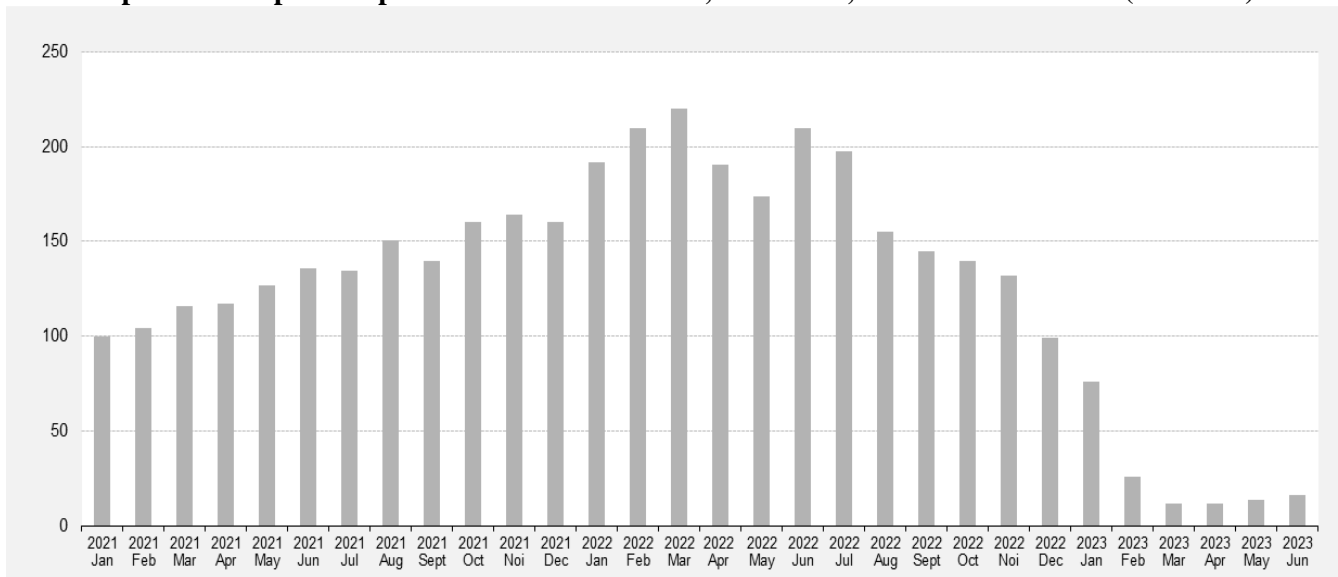


Source: Author representation, based on Eurostat data (2023).

As 13% of EU’s natural gas imports are still originated from Russia, even in 2023, the Graph 4 is clearly showing a massive decrease compared with 2022, while currently the main supplier for EU are US, Algeria and UK.

The most important effect of sanctions may be observed in the field of petroleum oil imports. After the imposition of sanctions, the petroleum oil imports from Russia are almost zero both in terms of value and of volume (See Graph 5 and Graph 6).

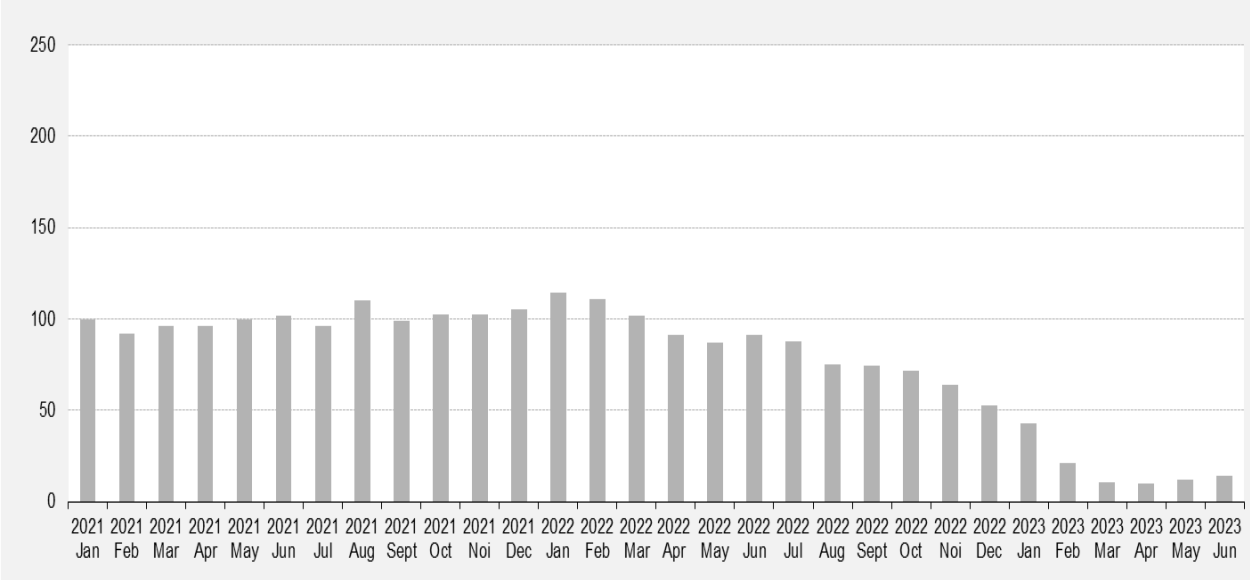
Graph 5: EU imports of petroleum oil from Russia, 2021-2023, value indexed at 100 (Jan 2021)



Source: Author representation, based on Eurostat data (2023).

As the Graph 6 is showing, the volume of imports of petroleum oil, decreased from 100 (indexed at Jan 2021), to only 14 in 2023, proving that the sanctions have fulfil their scope: to drastically reduce the EU dependence in the field from Russian Federation.

Graph 6: EU imports of petroleum oil from Russia, 2021-2023, volume indexed at 100 (Jan 2021)

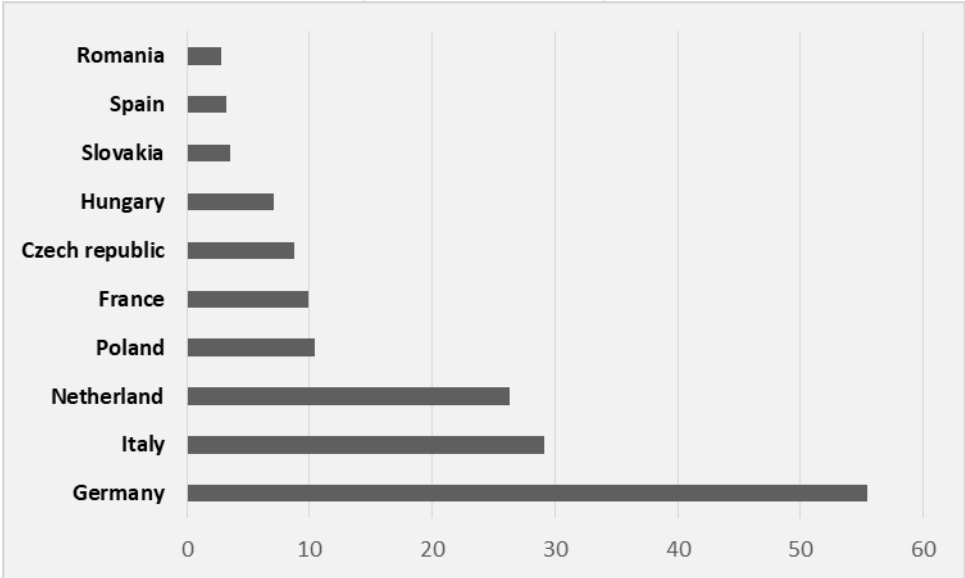


Source: Author representation, based on Eurostat data (2023).

As the EU managed to gradually reduce its energy dependence it is important to notice that are still Member States that have not totally reduced this unwanted symbiosis. From all the Member States, Germany had the greatest energetic link with the Russian Federation, but as stated by many analysis, that link has gradually faded as the geopolitical frozen path evolved between the two parties due to the multiple sanctions imposed (Gens, 2019; Lough, 2021).

The evolution of natural gas imports from the EU Member States shows that prior to the sanctions Germany held the first position in the EU’s hierarchy, followed by Italy, Poland and France (Graph 7). However, after the sanctions Germany has cut all its imports from Druzhba pipeline while the Nord Stream II project remains frozen.

Graph 7: Top 10 main importers of natural gas from Russian Federation in 2021, by country (Bn. Cubic meters)



Source: Author based on Statista (2023).

With regard to Russian crude oil shipments through the Druzhba pipeline, which were not sanctioned at the EU level, it should be remembered that, starting from December 2022, imports through the northern branch of this pipeline (to Germany and Poland) have registered a drastic decrease, as both states were already in the

process of ceasing purchases, while flows through the southern branch (to Slovakia, the Czech Republic and Austria) are expected to continue.

3.3. What are the future perspectives?

Some analysis (Pop, Drăgoi, 2019) have pointed out even before the outburst of the war in Ukraine the danger represented by the too great dependence of energy supply from Russia, while underlying the need to enforce a broader strategy to increase EU's security in the energy field. As stated by other studies (Drăgoi, Calanter, Neagu, 2023) the sanctions have created a massive cleavage between EU and Russian Federation, while the EU has deepened its engagement to the path of the green energy development.

The Green Deal is seen currently, along with the development of new partnerships, including in the LNG (liquefied natural gas) field, as the key for the EU's energetic independence. As for Russian Federation its strategy involves the deepening partnership with China seen as its main future partner in the energy trade.

However there are some difficulties for the both parties. While the green energies development has gain momentum, the largest share of EU's energy mix is still based on fossil fuels. Moreover, the development of most renewable energies depends heavily on imports of key technologies from China, so EU might replace the dependence of an autarchic regime with the dependence of another one, just as possible dangerous. For Russian Federation, the Asia pivot initiative might prove to be a bumpy road. Currently, the reorientation towards China, which is already a major economic partner for Russia, seems the ideal solution, but this approach involves a series of risks and challenges related to infrastructure.

There are several factors that make the redirection of Russian natural gas exports to China a practical impossibility in the short or medium term. The biggest challenges in this regard are related to infrastructure because natural gas simply cannot be transported as easily as oil, coal or other fossil fuels. There are currently two ways to transport large quantities of natural gas: through the gas pipeline network and by using a natural gas liquefaction plant to turn it into "liquefied natural gas" (LNG), which can then be transported by tankers special. However, both ways of transporting natural gas require the development of a specific infrastructure that is both complicated and expensive.

An assessment of Russia's ability to redirect gas flows to China requires consideration of the location of Russia's main gas fields. Currently, most of Russia's major gas fields are located in the West Siberian Basin, the largest hydrocarbon reservoir in the world. The two largest gas fields in Russia, the Urengoy and Yamburg fields, are located in the north of this area, in the Yamalo-Nenets Autonomous Region. These two natural gas fields are the world's second and third largest, respectively, surpassed only by the South Pars/North Dome gas condensate field in the Persian Gulf. In the far east of Russia is located another important gas field - Chayanda - located in the Republic of Sakha and which is part of the Vilyuy basin. The Chayanda gas field is estimated to contain a total of approximately 1.24 trillion cubic meters of gas.

The current pipeline infrastructure in Russia reflects the concentration of natural gas fields in the northwest of the country, given that they served a much larger export market, the European one, compared to the fields that could deliver gas for exports to the Far East. Currently, most of Russia's gas pipelines run from the Urengoy and Yamburg gas fields to the west to supply gas to the EU. The only export pipeline to the east that is operational is the Power of Siberia 1 gas pipeline (Sila Sibiri, Russian.), which carries gas from the Chayanda gas field to China. However, this pipeline does not have the capacity to take over the gas supplied to the EU so far, considering that, in 2021, only the Nord Stream 1 pipeline supplied 59.2 billion cubic meters of natural gas to European states. According to current estimates, the Power of Siberia 1 pipeline is planned to export 38 billion cubic meters of gas to China by 2030, but currently it exports only about 10 billion cubic meters per year.

Although volumes to China and India have increased, however, despite all these efforts, the impact of the sanctions on the energy trade of the Russian Federation cannot be neglected. If before the sanctions Russia had at its disposal a market that consumed more than 1.5 million barrels of crude oil per day through export terminals in the Baltic Sea, the Black Sea and the Arctic Sea, currently this market has been almost entirely lost and must be replaced by destinations over long distances to Asia, and these have the disadvantage of being much more expensive and also requiring much longer time intervals.

As a result of the sanctions, the preferred destinations of Russian crude oil exports have changed, with the latest statistics showing that, from January 2023 until April 2023, the EU states are no longer important for them, being replaced by China, India and Turkey. At the same time, a large part of the destination of Russian crude oil exports goes to non-G7 states, but also to "unknown" destinations. Regarding this last category, some analyses (Smityuk, 2023) show that they actually include ship to ship transports which is actually a way in which Russia manages to "circumvent" sanctions and export oil in the EU states through intermediaries.

4 Conclusion

Concluding on the effects of the energy embargoes imposed on the Russian Federation, we may say that the EU has successfully managed to significantly reduce its energy dependence from a partner that has proven volatile and unpredictable in the international arena. The success of EU's approach is due partly to its efforts to develop renewable energies, but also due to finding alternative import destinations (e.g. between January and November 2022, pipeline gas and liquefied natural gas (LNG) imports from Russia accounted for just under a quarter of all EU gas imports, while a substantial increase in LNG imports from Norway and Algeria was recorded).

The "sanctions energy war" seems to be affecting both sides quite a bit. Although the adjustment is also difficult for the EU states, which often import more expensive energy products as a result of the sanctions, the effects of the numerous EU embargoes are also felt for the Russian Federation, in particular by decreasing its income from energy exports (Russia's total income from the sale of crude oil and refined petroleum products in the first three months of 2023 amounted to only 27.3 USD billion, a very low level that is comparable only to the collapse during the pandemic period).

Our main finding is that while the sanctions have seriously affected the economic cooperation between EU and Russian Federation, causing a severe decrease of the bilateral trade, the energy trade still remains important for the two parties, as the enforced bans only affect only crude oil trade by sea and coal imports, while the natural gas trade is not targeted by the sanctions.

Our second finding shows that while the bilateral relations are stacked on a frozen path, neither EU or Russian Federation have been able to stop completely the energy trade since a complete replacement of the EU's natural gas imports from Russian Federation is still not possible, although Russian Federation's position as top source of EU's natural gas imports has been replaced with other countries.

Acknowledgement

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Türkiye, Between Economic Vulnerabilities and Political Ambitions as a Regional Power

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Abstract: The Turkish economy continued its strong post-pandemic recovery trend in 2022, with a growth rate of 5.6%, which exceeded authorities' expectations, with private consumption contributing significantly to economic growth, amid wage increases and the support provided for households with regard to energy costs. The earthquakes in Turkey earlier this year had a devastating impact on the population and on the economy in the southern country. The reconstruction effort will cover the losses incurred, so GDP will continue to grow over the next two years, but at a slower pace than in recent years. Exports will moderate, while imports will accelerate. Under the post-election effect, the new administration led by President Erdogan seems inclined to adopt radically different policies from those of recent years, returning to conventional methods of targeting inflation and restoring macroeconomic balance.

Key words: Economic outlook, Türkiye, inflation rate, natural disasters, economic nationalism

JEL classification: E00, E60, F52, O53

1. Introduction

Türkiye is one of the global emerging powers, given the size of its economy, the growth rate, its strategic geographical position that mediates trade on the East-West route and its productivity factors. Türkiye is located in Southeast Europe and Southwest Asia, having control of the Bosphorus and Dardanelles straits on the Black Sea, but also it widens to the Middle East. Türkiye has a large and expanding population with a low median age of the active population. Türkiye's population reached 85.27 million in 2022, 0.6 million up from the previous year, ranking 17th in the top countries by population size in the world and the 2-nd in Europe (Turkstat, 2023). Türkiye has been a NATO member state since 1952 and is the Alliance's second-largest military power. The state is a candidate for membership in the European Union, a process that has been dragged on for a long time due to political differences and security and justice issues raised by Western partners. With a nominal GDP expressed in US dollars at current prices of 906 billion, in 2022, Türkiye ranks 19th in the world, being part of the G20, the group of the world's top 20 countries by economy size (The World Bank, 2023). In terms of GDP / capita, with a value of USD 10,616 / capita, Türkiye falls into the category of emerging economies, with upper-medium incomes (CIA, 2023).

On February 6, 2023, starting at 4.17 a.m., southern Türkiye was hit by a series of devastating earthquakes, with a magnitude of 7.8 on the Richter scale recorded in the epicenter area near the city of Gaziantep, followed about 9 hours later by another, equally powerful, 7.5 degrees, located in the Kahramanmaraş county, as well as by numerous smaller aftershocks. On February 20, a 6.4 magnitude earthquake struck Hatay county, located in the same region (SBB, 2023). The quakes affected a total of 11 counties in Türkiye and 4 in Syria, making them the strongest in 20 years and as strong as the 1939 earthquake, the largest recorded in that region. They were the most devastating earthquakes recorded in Türkiye in modern times and the deadliest globally since the 2011 earthquake in Japan.

Türkiye's economic prospects for the current year, but also for the following years, are therefore under the impact of earthquakes. The damage produced by these hazards was estimated at 2,000 billion Turkish lira (103.6 billion USD, respectively 9% of GDP), with losses distributed as follows: housing (55%); public infrastructure and administrative buildings (12%); private sector, excluding housing (11%); insurance and macroeconomic impact (22%) (SBB, 2023).

This article presents **Türkiye's economic outlook for 2020-2024** based on the main macroeconomic indicators, **and provides** a qualitative analysis of the factors that have the greatest impact on the evolution of the economy during the reference period.

The tense regional geopolitical context, the late and seamless modernization of the Turkish state, with major historical reminiscences and influences since the Ottoman Empire, the natural disasters it faced just this year, all these make Türkiye's analysis from the perspective of its economic performance a difficult study. A study that is marked by many risk factors and uncertainty. The relevance of the study is, at the same time, indisputable, both for the decision-makers in Romania, given the common neighborhood of the two countries, as well as for the intense traditional relations. Nevertheless, the economic research of this country is of general relevance, regarding Türkiye's particular economic growth model and the unorthodox economic and monetary policies it applied in recent years.

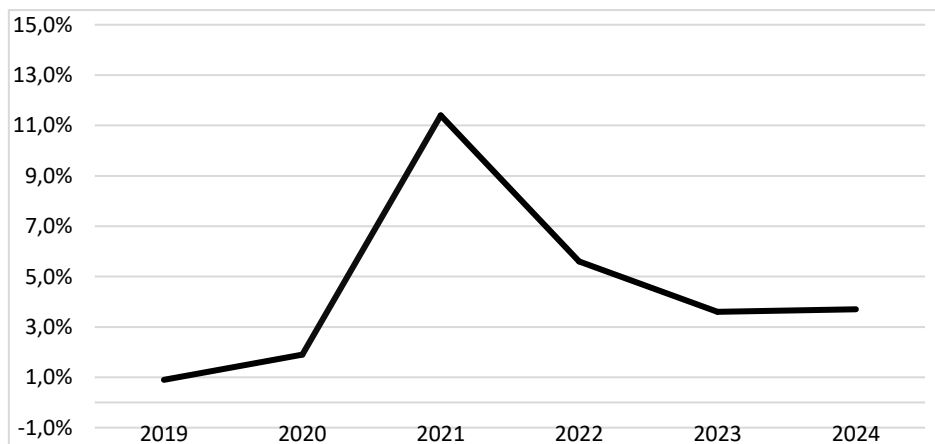
2. Türkiye's economic outlook

The Turkish economy continued its strong post-pandemic recovery trend in 2022, with a real GDP growth rate of 5.6%, which exceeded authorities' expectations (Figure 1). The start of the year was clearly favorable for exports, but they soon moderated in the second half of the year, while imports continued to grow. The foreign demand, due to the post-pandemic recovery, but also the development of technology-intensive sectors drove to a record volume of industrial production this year (European Commission, 2023).

The volume of exports of goods and services increased by 9.1% yoy, while imports also increased by 7.9%, with net exports contributing 0.4% to GDP growth (Turkstat, 2023).

The Turkish government has remained consistent in implementing the "Turkish economic model" which began in autumn 2021. This plan aimed to "achieve a positive current account balance, reduce dependence on external financing (in the short term) and increase the role of Lira in the economy (de-dollarization), while keeping the interest rates low and directing credit to productive and high value-added sectors. The plan also involves prolonging macroprudential measures and other complex and sometimes disruptive regulatory measures, such as in the case of financial markets" (European Commission, 2023).

Figure 1. Türkiye's economic growth rate, 2019-2024* (%)

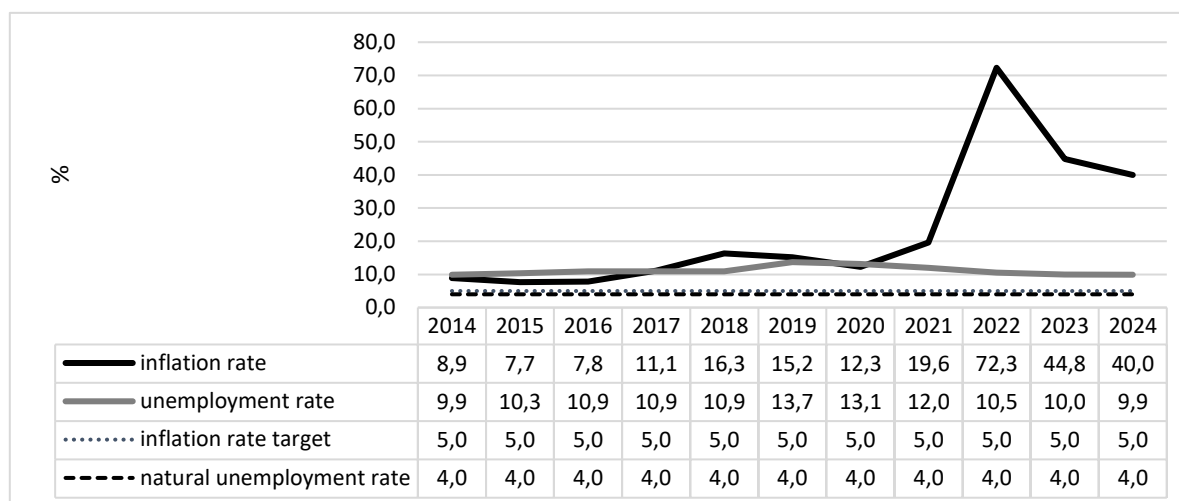


Source: OECD (2023), *2023-2024 – forecast.

Despite the performance in the economic activity, Türkiye's macroeconomic instability has deepened. The energy price crisis, aggravated by the war in Ukraine, which has affected the entire European continent, has also left its deep mark on the evolution of prices in Türkiye, both for industrial products and for consumer goods and services. The escalation of energy prices has reflected Türkiye's vulnerability linked to its dependence on imports of energy products, especially imports from Russia: Türkiye imports 99% of its natural gas needs, of which about 40% from Russia and also imports 89% of its crude oil and petroleum products demand, of which over 25% from Russia. Russia is Türkiye's main source of natural gas imports and its second largest source of crude oil, after Iraq.

Against this background, inflation has escalated to record levels, with the Harmonized Index of Consumer Prices peaking at 85.4% in October 2022. The annual average inflation rate was 72.3%, well above the central bank's target of 5%. This progression had a negative impact on the purchasing power of households, especially for low-income households.

Figure 2. Inflation versus unemployment rate, 2014-2024* (%)



Source: OECD (2023), * 2023-2024 – forecast.

In order to ease the burden of **general price increase** on the population, the authorities have adopted several measures to support incomes, including the accelerated increase of the minimum wage (by 50.6% in January 2022, by 29.3% in July 2022, by 54.6% in January 2023 and by 34% in July 2023). Thus, the net monthly minimum wage increased from 2,825 Turkish lira to 11,402, a nominal increase of 300%. The pro-cyclical measure was aimed to maintain the purchasing power of low-income households and support private consumption, the main component of GDP and the main driver of economic growth. Therefore, the private consumption raised by 19.3% in 2022 compared to the previous year. In addition, the authorities have adopted measures regarding energy costs, reducing or cancelling some energy taxes, compensating with subsidies the natural gas and electricity bills for different categories of population.

As regards the monetary policy, the central bank has maintained its unconventional approach, in line with the "Turkish economic model". Thus, despite price escalation, monetary policy has been expansionary, with benchmark interest rates successively reduced from 14% in 2021 to 9% in 2022 and 8.5% in March 2023. This fundamental contradiction with classical economic theory required a series of stimulus or, as the case may be, restriction measures in the sphere of financial economy and the banking system, including: imposing the obligation to maintain deposits denominated in lira, protecting deposits in lira from massive depreciation of the exchange rate, tax exemptions, obligations regarding foreign exchange reserves, establishing the obligation to sell to the central bank 40% of the currency obtained from sales by exporters, the obligation to maintain a 10% rate of assets consisting of government securities denominated in lira by banks, respectively 20% of the value of loans granted if the interest rate on loans exceeds 1.4 times the reference interest rate, setting capital safety rates and strict rules for granting loans for commercial purposes, etc. (European Commission, 2023). These measures distorted market price signals and aggravated financial risks, especially in the banking system. Despite all risks, the banking system remained resilient (OECD, 2023).

The lira's exchange rate depreciated by 40% against the US dollar in the first three quarters of 2022, before stabilizing at the end of the year. The depreciation of 80% against the dollar, cumulated over the last 5 years, weighs heavily on the cost of living of Turkish citizens. Efforts to prop up the lira have significantly weakened the country's foreign exchange reserves and lowered confidence among international financiers.

In terms of fiscal and budgetary policy, the Turkish government has managed to achieve the budget deficit target. In fact, the budgetary exercise was above expectations due to windfall revenues amid high inflation and additional profits of companies. The budget deficit was only 0.9% of GDP at the end of the year, below the authorities' forecast of 3.2% of GDP in September 2022 and below the 2021 level of 2.8% of GDP. This result was also positively reflected in the exercise of public debt. Thus, if at the beginning of the year the public debt-to-GDP ratio stood at 42.3%, the denomination effect of the lira, in the context of high inflation, reduced the public debt ratio to 31.7% of GDP at the end of the year. Under the effect of inflation, international experts anticipate a low ratio of public debt to GDP in the coming years, as well (European Commission, 2023).

The labor market remained vulnerable, with a persistent unemployment rate of 10.4% of the active population, but declining after the COVID-19 pandemic, when it reached 13%. The post-pandemic recovery trend is noted: the number of employees increased by 7.8% in 2022, especially in construction, trade and manufacturing. The

employment rate was 47.5% of the active population, compared to 42.7% in 2020. In contrast, large differences remain between men (65%) and women (30.4%). The youth unemployment rate also remains at an alarming 19.4%, down from 22.6% in 2021 (Turkstat, 2023).

In terms of the foreign trade balance, the indicators worsened, despite the exceptional performance of exports in recent years. Thus, the current account deficit widened to 5.4% of GDP, compared to 0.9% of GDP in 2021. It is also expected that the current account deficit will widen in the current year, due to reconstruction efforts in the region affected by natural disasters.

The main stimulus of Türkiye's exports was the depreciation of the lira's exchange rate against the currencies of trading partners. The value of imports increased in two directions: escalating energy prices in regional markets and the gold imports. Thus, the value of energy imports doubled compared to the previous year, having registered the main "contribution" to the current account deficit. At the same time, Türkiye achieved a surplus in trade in goods other than gold and energy (European Commission, 2023).

The foreign trade situation by destination countries and import sources is presented in Table 1.. The European Union consolidated its position as Türkiye's main trading partner, in particular as an export market for goods.

Table 1. Türkiye's main foreign trade partner countries by value of exports and imports, respectively, 2022

Rank	Country of destination of exports	Share in exports (% of total value)	Source country of imports	Share in imports (% of total value)
1	Germany	8.4	Russia	18.0
2	USA	6.7	China	13.0
3	Iraq	5.4	Germany	7.4
4	United Kingdom	5.1	Switzerland	4.7
5	Italy	4.9	USA	4.7
6	Spain	3.8	Italy	4.3
7	France	3.8	India	3.3
8	Russia	3.7	France	2.9
9	Others	58.2	Others	41.7

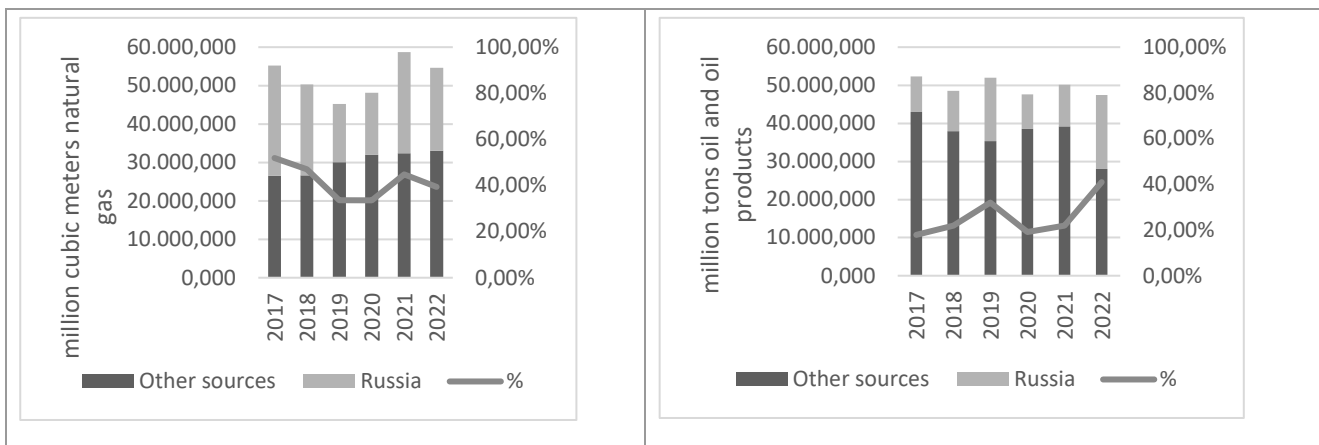
Source: compiled by author, based on data (Trading Economics, 2023)

With the reconfirmation of Mr. Recep Tayyip Erdogan as president after winning the presidential elections in May 2023, doubled by ensuring the government by the president's party, the Justice and Development Party (AKP), the Turkish government has entered a new stage, with a radically different approach than in recent years: under the pressure of a necessary infusion of external funds to finance reconstruction in the earthquake zone, amid rampant inflation, the Turkish administration has abandoned loose monetary policy and is trying to target inflation using conventional methods. The changes at the top of the central bank and the finance minister have brought a more inclined approach a more inclined approach toward a monetarist policy of macro-financial stabilization. Therefore, the first decisions aimed to increase the reference interest rate from 8.5% to 15%, in an attempt to temper inflation. Fiscal measures are also expected to restore macroeconomic stability, aimed at alleviating the current account deficit and restoring foreign exchange reserves.

3. Türkiye – Russia trade relations

Following the invasion of Ukraine by the Russian Federation, trade relations between Türkiye and Russia intensified, despite economic sanctions imposed by NATO and the European Union, which Türkiye did not submit to. Thus, the volume of trade between the two countries increased from \$ 34.73 billion in 2021 to \$ 68.19 billion in the year of analysis, practically doubling. In particular, Türkiye's imports increased from \$28.95 billion to \$58.85 billion. Türkiye was among the first countries to take advantage of the EU's imposition of sanctions, after China and India. Since April 2022, Türkiye 's oil import volume from Russia has doubled, benefiting from a very advantageous price (USD 37.8/barrel, compared to USD 60.12/barrel at the beginning of the invasion) (Nordic Monitor, 2023). As shown in Figure 1, imports of crude oil and petroleum products from Russia increased in particular, reaching a share of 41% of the total import volume, compared to 22% in 2021. For natural gas, although the volume of imports from Russia decreased by about 19% compared to the previous year, it accounted for 40% of the total volume of Türkiye's imports.

Figure 3. Evolution of Türkiye's import volume of natural gas and oil respectively and dependence on imports from Russia, 2017-2022 (%)



Source: compiled by the author, based on corroborated data taken from (S&P Global, 2023), (Statista, 2023), (Trading Economics, 2023) and (Nordic Monitor, 2023)

The cooperation between the two states was not limited to energy products. Türkiye also imported from Russia the equipment needed to build this year the first nuclear reactor of the Akkuyu plant, located in the south of the country. The plant, comprising four VVER-1200 reactors designed, owned and operated by Rosatom, Russia's state-owned energy company, will be fully operational in 2026 with a total capacity of 4,500 MW. The plant will produce about 10% of Türkiye's electricity needs.

Amid the war in Ukraine and the rupture of relations between the European Union and the Russian Federation, Türkiye steps forward to become the winner in the energy sector. Already, part of the natural gas and crude oil flows, flowing in the East-West direction, from the Russian Federation, have been redirected through Türkiye. Türkiye could become a regional energy hub in the medium term, especially as it seeks long-term partnerships with producer countries in Central Asia, such as Turkmenistan and Azerbaijan or the in Middle East, including Iran and Libya, thus facilitating energy transit to Central and Western Europe. In addition, Türkiye has made new discoveries of natural gas deposits in the Black Sea, in the Sakarya perimeter, exploitable since this year, which will reduce its dependence on imports.

4. Conclusions

In conclusion, one-off factors have a predominantly negative impact on Türkiye's economy, which has been experiencing major macroeconomic imbalances in recent years, despite sustained economic growth and relatively rapid recovery from the COVID-19 pandemic.

The factors that influenced Türkiye's economic evolution in 2022-2023 were the following: the revival of the external demand after the pandemic and the strengthening of Türkiye's position as one of the main regional producers and exporters of industrial and consumer goods; the persistence of macroeconomic risks and instability amid the implementation of the Turkish economic model and the adoption of non-standard monetary measures; the devastating earthquakes in the south of the country in early 2023, with major impacts on the local population and the region's economy; the energy price crisis and huge dependence on energy imports; the war in Ukraine and the persistence of regional geopolitical tensions; strengthening Türkiye's trade relationship with the Russian Federation; the holding of general and presidential elections in May this year.

The earthquakes in Türkiye earlier this year had a devastating impact on the population, causing human and material losses unprecedented in the modern era of this country. The reconstruction effort will compensate for the losses suffered, so GDP will continue to grow over the next two years, but at a slower pace than in recent years.

The earthquakes caused damage estimated by the government at about \$103 billion (9% of GDP), consisting mainly of collapsed or majorly damaged housing, followed by losses caused to the private sector, through affected commercial and industrial buildings, public infrastructure and macroeconomic impact. The industrial production sector is the most affected in the short term, followed by agriculture, trade and tourism.

Also, the macroeconomic impact is relevant, earthquakes having an effect of increasing prices this year, after Türkiye experienced a massive escalation of inflation rate in the previous year. The inflation rate will remain very high this year as well. In addition, the government's rescue and reconstruction efforts require additional budget spending allocations, which will deepen the budget deficit to 5% of GDP this year. At the same time,

demand for imported raw materials and materials for reconstruction is increasing, while impact on exports remains negligible. As a result, the trade deficit is deepening, putting pressure on the external debt and, implicitly, on the exchange rate of the Turkish lira.

Under the post-election effect, the new administration led by President Erdogan seems inclined to adopt radically different policies from those of recent years, returning to conventional methods of targeting inflation and restoring macroeconomic balances.

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The Potential Return of the German Economy to the «Sick Man Of Europe» Status: Causes, Risks and Possible Implications

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Abstract: Around a quarter of a century since Germany was labelled “the sick man of Europe” for the first time, the weak performances the federal economy experienced this year brought the country back to the centre of European and international debates regarding the likely risks posed by the possible lengthening or acceleration of the current cycle of economic decline. While, in the past, the triggers of the first stage of profound contraction experienced by Germany were mainly endogenous (i.e. huge costs required by the completion of the reunification process, a stagnant labour market, an excessive taxation system etc.), at present they are mainly based on the interaction of destabilising forces of exogenous origin: the impact of the Covid-19 pandemic, followed and amplified by the consequences of the Russian-Ukrainian conflict and the resulting energy crisis. Against the background of the recent geopolitical context, our article seeks to provide a comparative analysis (past vs. present) of the two recession phases that Germany went through, revealing both the causes of their occurrence, and the steps taken (or envisaged) by the national decision-makers to help the federal economy recover and to relaunch growth. We will also highlight in our research the potential domino effects for the other European Union Member States, which could be triggered by a lengthy or profound German recession.

Keywords: German economy, “the sick man of Europe”, German growth model, structural challenges, reform

JEL classification: E00, E01, E32, E66

1. Past references: Germany’s journey from “the sick man of Europe” to a new “economic miracle”

1.1. Explanation of notions

With its first use attributed and attested by historians to have belonged to tsar Nicolay I of Russia¹ (de Bellaigue, 2001), the phrase “*sick man of Europe*” was employed over the years to designate a large European power in a (prolonged) stage of decline (e.g. economic, (geo) political, structural etc.), which generates destabilising forces able to trigger chain effects for other states, thus inducing a risk of contagion.

Later on, during the 20th century, this label began to be used by analysts, researchers and representatives of the academic environment and/or of the international economic media to describe the poor situation experienced by Russia during the 1917 Revolution or the decline of the British Empire (in the 1970s). In 1998, as a result of the major challenges generated by the reunification and the subsequent low-performance results, economist Holger Schmieding² used it to refer to Germany (Prakash, 2023; Schasfoort, 2023). Then, in the context of the launch of the euro, which fed into the Community fears that the prolonged decline experienced by the federal economy could cause contagion effects for other European countries, in 1999, an analysis developed by the British publication *The Economist* called Germany “*the sick man of euro*” (The Economist, 1999). Despite the unfavourable circumstances briefly described above, both as a result of the ample reforms started in the early 2000s (“the 2010 Agenda”), and of the somehow unique structure of the German economy (i.e. a profoundly decentralised wage negotiation system) – which we will present in the course of this analysis –, beginning with 2005, the country started a sustained recovery and relaunch process, turning from a stagnating economy into a

¹ Who, in the second half of the 19th century (1853), used it to describe the progressive weakening of the Ottoman Empire, which threatened to undermine Europe’s already fragile balance (McCollum, et al.).

² Who was at the time the chief economist of the European Division of the U.S. investment bank “Merrill Lynch”.

true development model, being metaphorically named an “economic superstar”³ (Dustmann C. , Fitzenberger, Schönberg, & Spitz-Oener, 2014; Dustmann C. , Fitzenberger, Schönberg, & Spitz-Oener, 2018). In 2023, two decades and a half after being called the last in line in Europe, contradictory discussions have begun again at national and international level regarding both the medium- and long-term evolution of the largest European economy, as well as regarding the likely chain effects that its possible entry into a phase of prolonged recession could have for other EU Member States.

1.2. The first “disease” of the German economy (1998/1999-2005)

1.2.1. Causes of the onset of the first major economic contraction

In the period immediately preceding the start of the new millennium, the German economy was facing ample challenges caused by the cumulated action of a set of factors of both internal, and external nature: a) the impact of the economic costs generated by the reunification (1990) and by the need to bridge the productivity gaps between West Germany and East Germany, two countries that were situated on very different levels in terms of development and social welfare; b) the adoption of the West German currency⁴ at a greatly overvalued rate, of 1:1 DM/DEM, in the conditions in which, prior to the reunification, the parities on the currency market varied between 1:3-1:7 (Dauderstädt, 2013); c) the negative consequences of adopting an erroneous economic policy (on the labour market, in particular on the labour market), which led to the intensification of pre-existing deficiencies; d) the effects of the economic shocks occurring on the world stage – i.e. the Mexico crisis (1994-1995) and the Asian financial crisis (1997-1998) –, which, in correlation with a significant appreciation of the national currency, affected the evolution of German exports, already on a downturn as a result of the discontinuation of certain economic flows of the former GDR (i.e. to the ex-communist block) (European Commission, 2002).

As a consequence of the rapid increase of the salary income above the productivity rate of the former GDR – on the one hand, as a result of the exchange rate overvaluation and, on the other hand, as a result of the trade union pressures which determined salary increases up to the level of those in the West –, correlated with the discontinuation of the traditional commercial flows⁵, the East German economy started to collapse. In these conditions, the completion of the GDR incorporation process – desirable and politically indispensable – required that around 50% of the consumption of the former democratic republic be financed by West Germany, using funds that mostly came from transfers from the social security system, together with government loans⁶. As it turned out, the enormous cost of the unification burdened the German economy to an unprecedented degree, partly accounting for the weak performances the country achieved during the 1990s and until the early 2000s. Also, it must be noted that while Germany was trying to overcome the major difficulties it was facing during the final years of the 20th century, the economies of other EU Member States were going through a stage of sustained growth (Chart 1).

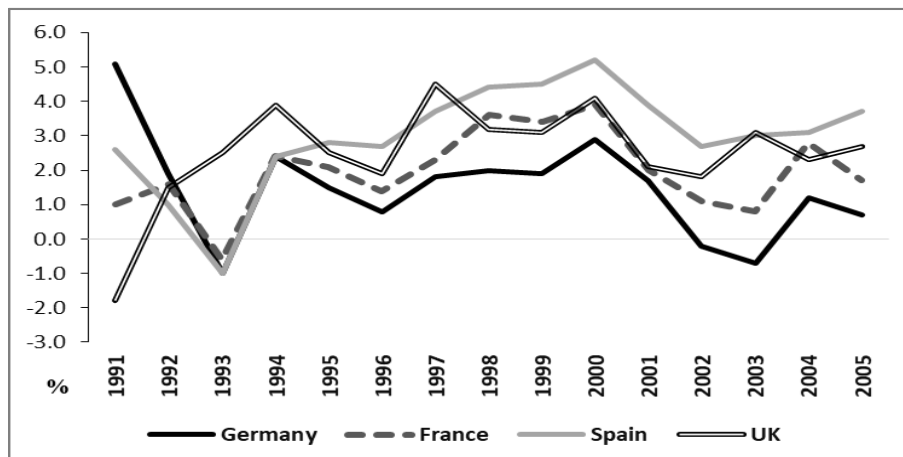
³ In the period of more than a decade (2006-2018), that the “new German miracle” lasted, a series of EU Member States took turns at being called “the sick man of Europe”: Italy (2005), Portugal (2007), Greece (2011), and even the Eurozone as a whole (2013).

⁴ In 1990, the Deutsche mark (DM) replaced the former East German currency – *Ostmark* (in German) [DEM].

⁵ In the conditions in which, on the one hand, the former socialist states that were traditional trade partners of the GDR were facing their own imbalances caused by the collapse of the communist regime and, on the other hand, because reunification required a reconfiguration of the commercial relations of the two ex-republics that were now forming a unitary state.

⁶ According to estimate calculations made by the *German Council of Economic Experts*, in the period between 1991 and 2003, these transfers totalled approximately EUR 900 billion, which represented around half of Germany’s annual GDP at the time (German Council of Economic Experts, 2004).

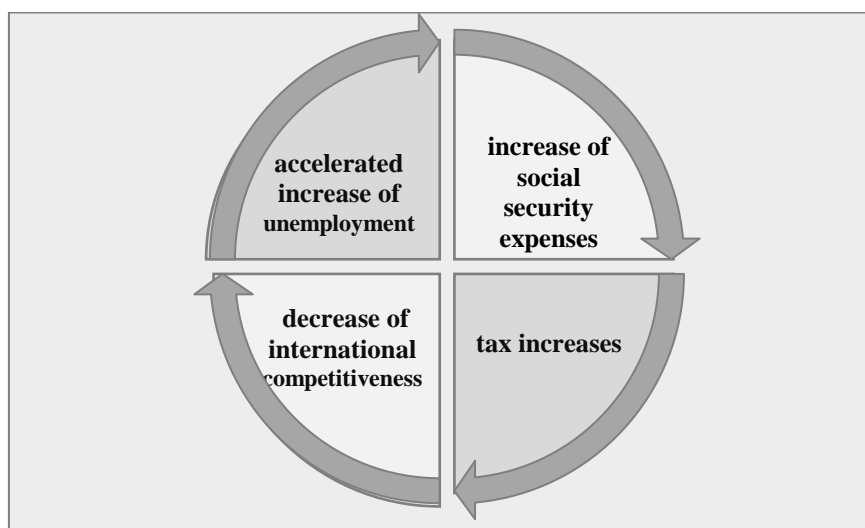
Chart 1: Year-on-year variations of Germany’s real GDP growth rate compared to other EU Member States, 1991-2005 (%)



Source: Author’s graphic representation based on the data published by the Federal Statistical Office (Destatis), Eurostat, World Bank (2023).

At the same time, East German unemployed persons and persons at the standard retirement age – or those who requested early retirement before reaching this age – were receiving social benefits without having paid contributions to the West German social security system and, furthermore, without any solid basis of similar contributions in East Germany. In these circumstances, to maintain the sustainability of the national social security system, the monthly individual contribution rates were substantially increased, determining an increase of non-wage related workforce costs. On the medium and long term, this measure determined an accelerated trend among German companies, including SMEs, considered to be the backbone of German industry, to externalise production to Central and East-European countries (as a result of the intensified globalisation process), thus exercising new pressures on the labour market and causing a further deepening of unemployment (already a two-digit figure). This is how a vicious circle was created which in the end led to a reduction in the competitiveness of German exports (Figure 1), the foundation around which the national growth model was gravitating.

Figure 1: Components of the vicious circle that affected the German economy in the late 1990s and early 2000s



Source: Synthetic processing and graphic adaptation by the author based on The Economist (1999) and Schasfoort (2023).

Against the background marked by the tensions described, the integration into the Economic and Monetary Union (EMU), accompanied by the introduction of the European single currency beginning in 1999, represented a new source of concern for the German governmental authorities, because it brought with it the loss of national control over the monetary policy in favour of the European Central Bank (ECB), as it was now

impossible for the Deutsche Bundesbank to establish the interest rate and/or use the exchange rate as an economic policy instrument, or to resort to other alternative adjustment mechanisms in the future.

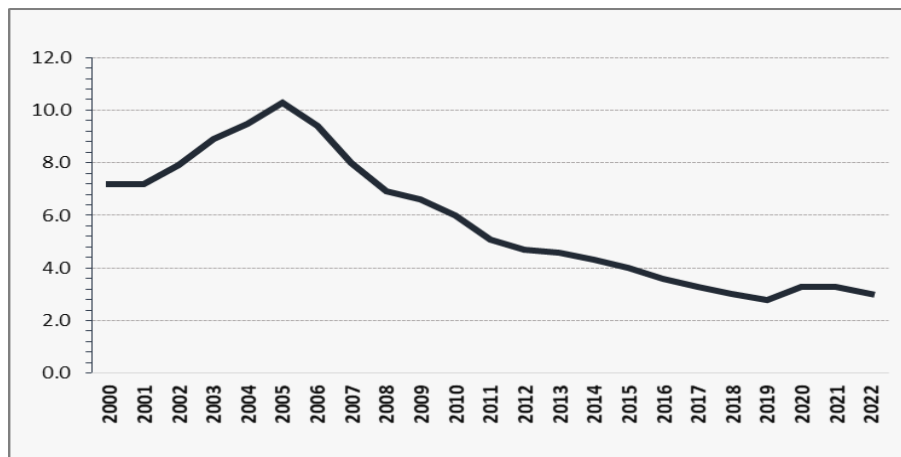
As we stated at the beginning of our analysis, a direct consequence of Germany's low-performance economic results in the period after 1990 was that of being labelled "the sick man of Europe". However, this perception was by far more dominant domestically than abroad, with a very large number of German economic analysts, representatives of the national political and business environment, as well as numerous economic research groups and think tanks pleading in favour of the strict necessity to reform the labour market and the social security system, and warning against the imminent risk of otherwise losing external competitiveness (Dauderstädt, 2013). Although, at first, the federal government led by Gerhard Schröder (1998-2005) received with scepticism the arguments brought by the national economists, as Germany was recording a permanent surplus balance of trade, despite the reduced competitiveness invoked by reform promoters, the coalition formed of the social democrats and the environmentalists eventually aligned itself with the dominant internal rhetoric.

1.2.2. Measures intended for economic recovery and relaunching growth

The reform package proposed by the Schröder Chancellery – a series of measures reunited under the title "Agenda 2010", but generally known as the "Hartz Reforms" (IV) – materialised in the preparation of four distinct regulations (with a phased applicability: 2003-2005), centred on a few main directions of actions and aimed at: a) revitalising and streamlining the labour market and the national social security system (by reducing social benefits and/or strengthening the conditions for their granting); b) speeding up the processes for the reintegration of unemployed persons on the labour market (such as: the introduction of professional training courses, the reduction of the period during which the unemployment benefit was granted, the extended use of fixed-term contract employment etc.); c) the liberalisation and flexibilization of the market in order to boost workforce demand (e.g. extended use of marginal employment forms; the granting of subsidies to enable the transition from unemployment to entrepreneurship etc.) (Ruoff, 2016); d) restructuring the pension system (e.g. the reduction of the share of the gross monthly salary used in the pension calculation formula, increase of the retirement age etc.) (Bastasin, 2013).

Structural reforms introduced on the labour market and in the German social security system (Hartz IV) represented the building blocks for the future economic growth, due to the enhanced pressure exercised on the unemployed to re-enter the labour market, which proved to be effective in a few years (Chart 2).

Chart 2: Evolution of unemployment rate in Germany⁷, 2000-2022



Source: Author's graphic representation based on data published by Destatis (2023).

Nevertheless, although according to some authors the Hartz reforms represented the catalyser for the achievement of the future "German miracle" (Bouvard, Rambert, & Romanello, 2013), others consider that their scope was too modest to have been able to trigger a significant increase of competitiveness and the major decrease of German unemployment, or to have generated later on the performances reached by the federal labour market during the deep recession of 2008-2009 (Dustmann C., Fitzenberger, Schönberg, & Spitz-Oener, 2014). As such, economic analysts belonging to the second group argue that the main factor that determined the relaunch of economic growth was the German wage moderation policy⁸, a direct result of the acceleration of the

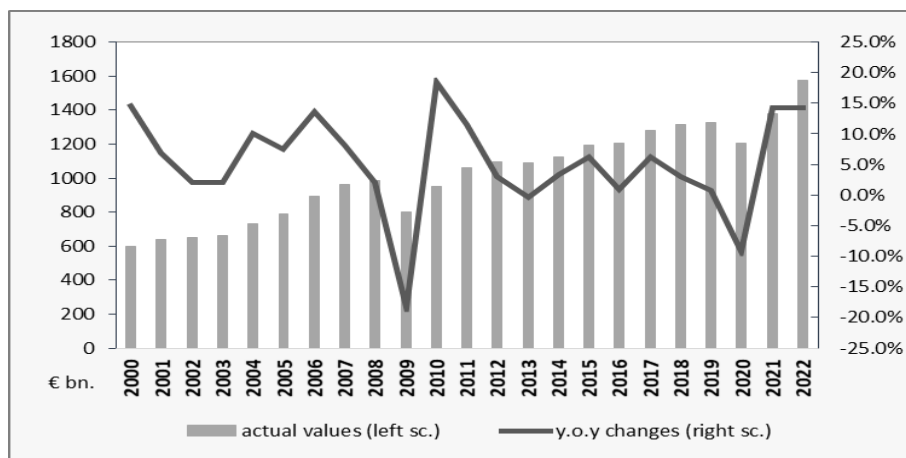
⁷ According to the concept of the International Labour Organization (ILO).

⁸ Initiated in the mid-1990s, i.e., before the launch of the "Agenda 2010" reform program.

decentralisation of the German collective bargaining co-decision procedure in each and every company⁹, which shifted from the sectoral and regional level (previously), to a company-specific one. In other words, the new realities of the time and the increasing trend among German companies to externalise their production activities to the emerging economies of Central and Easter Europe – where labour costs were significantly lower – led to a change in the pre-existing relations established between employer federations, on the one hand, and unions and/or works councils on the other, in the sense that, in order to re-establish the health of the national economy, the latter proved a flexibility that exceeded initial expectations, and accepted a series of concessions and derogations from the sectoral conventions (Baccaro, 2018).

In our opinion, the two types of measures – the Hartz reforms and those seeking to curb down the salary income dynamics – acted concomitantly and strengthened each other, with their combined action resulting, on the one hand, in the decrease of labour unit costs¹⁰ and, on the other hand, in the increase of employment (in particular in export industries). The simultaneous action of these favourable vectors, coupled with the depreciation of the euro (at the beginning of the 2000s), enabled the German industry (weakened during the post-reunification period) to regain its external competitiveness, leading to the progressive acceleration of the demand for German exports (Chart 3).

Chart 3: Evolution of German exports, 2000-2022



Source: Graphic representation and calculations of the author based on the data published by Destatis (2023).

As we have shown, until 2005, the year in which Angela Merkel became Chancellor (in November), the state of the German economy was not yet stabilised, as the country’s economic growth was still falling short of potential (Chart 1) and its unemployment was still high (a double-digit rate; Chart 2) – indicating that the effect of the measures adopted by the previous government had yet to be felt¹¹ –, the position of government finances was and had already been for several years in breach of the EU regulations in the field, while exports, the main growth pillar, continued to be exposed to the risk of losing competitiveness.

1.3. The pathway towards the new German “economic miracle”

Beginning in 2006, the German economy started to feel the first stimulating effects caused by the structural adjustments implemented in the previous years. The economic relaunch process that began was mainly driven by exports and investments – in the conditions in which, against the background of salary limitations and the resulting budget constraints, private consumption continued to remain at a low level –, determining the additional increase of employment and the creation of jobs with a high technological component. In addition, there were also other factors that played their part in the economic revival installed in the federal economy: a) the increase of the volume of global trade, fuelled by the growing demand from the emerging Asian countries (China, in particular); as well as b) the favourable conditions resulting from the creation of the EMU which eliminated the risk of appreciation of the exchange rate in relation to the currencies of European partners.

⁹ This process was possible because of the specific governance structure of the German industrial relations system at business sector level. Although this structure is not regulated by law, nor dictated by political decision-makers, it is still stipulated in the contracts and agreements concluded between the main three categories of social partners active on the labour market: union organisations, employer associations and works councils (employee representatives).

¹⁰ For example, in the 2000-2008 interval, nominal unit costs with the workforce only grew 5% in Germany compared to 30% in countries such as Spain or Italy (Delorme, Leron, & Padis, 2021).

¹¹ Being known that the labour market is slow to react to external stimuli.

Subsequently, the government led by Angela Merkel continued the series of reforms aimed at creating jobs, increasing the competitiveness of national companies and speeding up investments. From among these, we mention: a) the reduction of unemployment insurance contributions, a measure funded from the increase of the VAT rate (from 16% to 19%) [in 2007]; b) the decrease of the tax rate applied to undistributed company profits¹² [in 2008].

As a consequence of the reforming policies which contributed to the increase of the international competitiveness of German exports, the labour market continued to improve its performances even during the two consecutive crises that affected the international and European economies beginning with the end of 2008¹³. Germany's high external competitiveness was reflected by the permanent trade and current account surpluses (after 2001, when the last one was recorded) [Table 1].

Table 1: Germany's main macroeconomic indicators, 2000-2022

	2000	2005	2010	2015	2020	2021	2022
GDP (EUR bn.)	2,109.1	2,288.3	2,564.4	3,026.2	3,403.7	3,601.8	3,869.2
GDP/inhabitant (EUR bn.)	25.892	28,134	31.942	37,046	40,929	43,481	46,264
Persons in employment (domestic concept, mil.)	39.8	39.2	41.0	43.0	44.8	44.9	45.5
Unemployment rate (ILO concept, %)	7.2	10.3	6.0	4.0	3.0	3.2	3.1
Trade balance - goods (EUR bn.)	59.1	158.2	154.9	244.3	180.4	175.3	82.3
Trade balance - goods (as % of GDP)	2.8	6.9	6.0	8.1	5.3	4.9	2.1
Current account balance (EUR bn.)	-38.8	105.5	142.1	261.1	240.2	266.7	162.3
Current account balance (as % of GDP)	-1.8	4.6	5.7	8.6	7.1	7.4	4.2

Source: Author's compilations and calculations based on the data published by Destatis and Deutsche Bundesbank (2023).

Even in the years in which the world economy was affected by the financial crisis (2008-2009) or by the sovereign debt crisis (2012-2013) – which were shocks that severely affected international trade –, the Germany's current account surplus against the GDP was of around 6% (Deutsche Bundesbank, 2023).

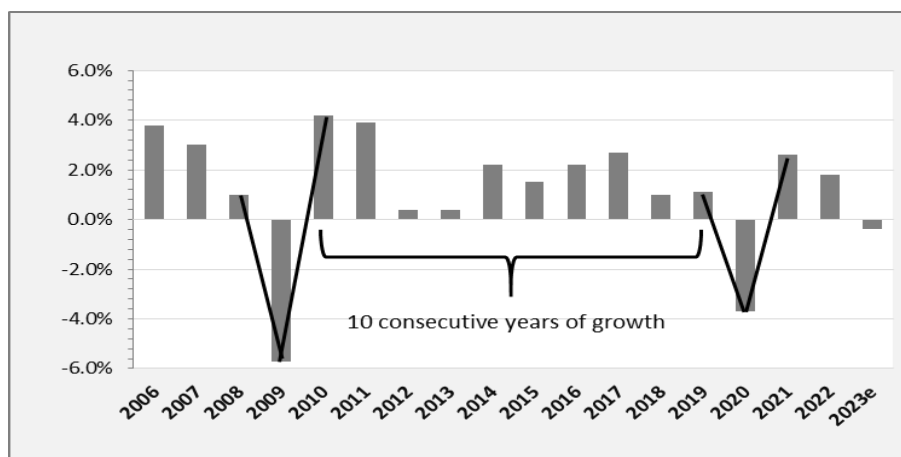
However, it must be noted that the occurrence of the financial crises had a particularly severe impact on the German economy too, causing the most serious contraction of the annual GDP in the post-war period (of 5.9%: Chart 4), in the context in which the ample decrease of global demand affected the fundamental pillar of the federal economy – exports (which decreased by more than 18%: Chart 3). In response, the federal government led by Angela Merkel launched two Keynesian-inspired anti-cyclic packages comprising a series of interventionist measures that were unusual for the German standards on budget austerity. These consisted of tax cuts accompanied by the use of reduced working hours (*Kurzarbeit*) which, during the crisis, covered over 1.5 million jobs¹⁴. The government's strategy proved to be a successful one in the conditions in which the global economy recovered surprisingly fast and, with it, the demand for the products of the German economy as well, a trend that significantly boosted the rapid relaunch of growth.

¹² In fact, this was the only tax cut measure adopted during Angela Merkel's administration, except for those comprised in the packages that sought to counteract the crisis situations (of 2009 and 2020), because with the "debt brake" introduced as a Constitutional amendment – in the context of the financial crisis of 2009 –, the country's tax system became much stricter.

¹³ For example, while during the financial crisis states such as Spain or Greece were seeing unemployment rates that fluctuated between 21 and 25%, in Germany, the number of unemployed persons progressively decreased and, at overall EU level, Germany became one of the countries with the best results in this area (Petersen & Esche, 2016).

¹⁴ Despite the overall disturbances in the economic activity, Germany was the only major economy that recorded a decrease of unemployment during the financial crisis.

Charts 4: GDP growth in Germany: percentage changes on the previous year, 2006-2023*



Note: * current estimates for 2023;

Source: Author's graphic representation based on the data published by Destatis (2023) and the European Commission (2023, for estimates).

As shown by the data above, the abrupt reduction of the federal GDP in 2009 was followed by a very strong recovery beginning with 2010 – a “V-shaped” recession –, which repositioned the German economy on the trajectory started in 2006.

As a result of the performances achieved in the 2010-2011 interval – respectively: a) a GDP₂₀₁₁ higher than that achieved in the years before the crises; b) an employment rate on a dynamic trajectory; and c) a manageable public debt ceiling which could be supported by the increase of tax revenue (although public debt was significantly higher than in 2006-2007, at approximately 79% of the GDP in 2011, compared to 64% in 2007, it remained well below the levels seen in other Eurozone countries) –, Germany gained its “superstar” status among European economies.

Looking at German economy's evolution, we can see that except for the post-reunification period, major imbalances were not triggered from the inside, but were caused by a series of exogenous factors. Following the same path, immediately after the end of the global financial crisis, Germany faced another major challenge of external origin: the sovereign debt crisis. Although the tensions caused in the Eurozone slowed down the impetus of the federal economy in 2012/2013, the acceleration of the demand coming from the U.S. and from the emerging markets (especially from China), the continued low exchange rate of the euro and the reduction of the interest rate generated a new boom for German exports, contributing to the recreation of the conditions favourable for economic growth. Also, it should be reminded that the new geo-economic context remodelled by the financial crisis caused a change of direction in the German economic policy, leading to a closer cooperation with China. After the orientation of external commercial activity towards China supported the federal economy during the financial crisis (exercising a sort of buffer effect), the executive led by Angela Merkel focused on the business and other future economic benefits that Germany could obtain from further consolidating mutual relations and from collaborating with China (the reiteration of the development paradigm governed by the axiomatic principle of the *change through trade* – substantiated by the Ostpolitik –, which had been at the basis of the German growth model for several decades).

The strong economic growth after 2005, the record employment level and the low unemployment rates – which led (at first) to an equilibrium in the federal budget and to public finance surpluses –, the resulting major and systematic current account surpluses represented the results which created the auspices for the second decade of the 20th century to be called the period of glory of the German economy, with the best performances achieved in the post-reunification era, despite the negative effects caused by the two successive crises that Germany went through.

Nevertheless, beginning in 2018, the German economy started showing signs of stagnation, caused both by the pronounced slowdown of the manufacturing industry – against the background of the escalation of commercial conflicts at international level and of the induced state of uncertainty –, as well as by the structural challenges faced by the automotive industry¹⁵, one of the main sectors of German exports.

Before the outbreak of the Covid-19 pandemic – whose impact generated the second largest contraction of the German economy in the post-war period –, the state of the German economy was much less robust than in the

¹⁵ As a result of the increased demand for electric cars.

period of the 2008/2009 recession or of the 2012/2013 stagnation, as a result of the absence of structural reforms during the last decade, the profound demographic changes the country went through, as well as the reduction of international competitiveness because of the reduced investments, both in the traditional and in the digital infrastructure (Brzeski, 2019).

The onset of the pandemic crisis, the subsequent restrictive measures adopted in order to slow down the spreading of the virus and the blockages occurred in the supply chains caused the federal economy to enter a new period of profound recession which marked the discontinuation not only of a period of ten consecutive years of economic growth, but also of a decade of performances, which could have gone down in history as the period of the greatest economic achievements after Germany’s reunification.

2. Present aspects: the current state of the German economy

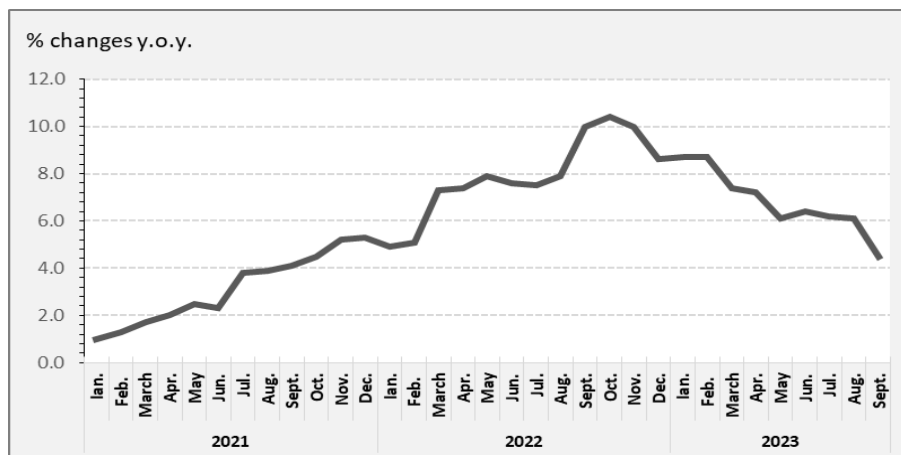
2.1. The profound negative impact caused by the recent successive shocks

After facing the severe effects caused by the rapid spread of the COVID 19 pandemic, in successive waves, in 2020 and 2021 – a situation that required the implementation of large-scale and lengthy restrictive measures to counteract the installed sanitary crisis –, the beginning of 2022 brought with it another major challenge for the national economic activity: the start of the military aggression of the Russian Federation against Ukraine. The start of the of the Russian-Ukrainian military complex further deepened the ample imbalances already existing on the European and international energy markets¹⁶, because in addition to the accelerated price increase, the deterioration of the geopolitical climate enhanced the risk of a natural gas supply shortage, if the Russian Federation decided unilaterally to discontinue its exports as a reaction to the sanction packages applied by the EU Member States (which actually happened in August 2022).

Moreover, for Germany’s strongly industrialised economy, the escalation of geopolitical tensions generated a series of distinct challenges, *first of all* because Germany was a net importer of almost all fossil fuels (except lignite), which made it extremely vulnerable to energy crises (with all the implications they can cause) and, *secondly*, because it was highly dependent on the supply of natural gas from the Russian Federation which, during the last two years (2020 and 2021) supplied Germany with over 55% of total imports (Federal Ministry for Economic Affairs and Climate Action, 2022).

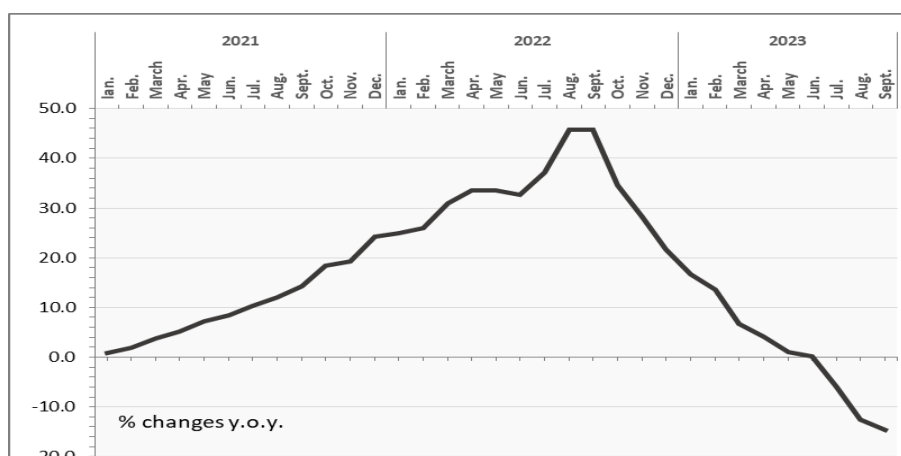
The steep increase of the quotations of energy raw materials on the international market – in particular after August 2022, when the Russian Federation totally stopped the flows of natural gas to Europe through the Nord Stream 2 gas pipeline – exacerbated the inflationist pressures that were already on an upward trend (Charts 5 and 6), exercising a deep unfavourable impact on both the German households’ propensity for consumption and on the internal industrial production already affected by: a) the impaired functioning of global supply chains; b) the Chinese isolationist policy (i.e. “zero-COVID”); c) the slowdown of global demand, and d) a series of structural deficiencies progressively accumulated after 2018 (Heyman, 2020).

Chart 5: Consumer price index (CPI) in Germany – percentage changes for the same month, year-on-year, 2021-2023



¹⁶ Caused by the sudden and generalised demand after the pandemic “peak” was overcome and the world economic activity was resumed.

Chart 6: Producer price index for industrial products in Germany – percentage changes for the same month, year-on-year, 2021-2023



Source: Graphic representations by the author, based on data published by Destatis (2023).

As it results from the data presented, CPI maintained a strong upward trajectory throughout 2022, with maximum intensity thresholds in September-November, when it reached a two-digit figure. The same trend was followed by the prices of industrial goods, but in their case the decrease occurred more rapidly and was steeper. Nevertheless, by the end of the year, the cumulated action of all the aforementioned external factors with negative influence was mitigated by the launch of ample support packages aimed at stabilising population income and the activity of national companies. These schemes were continuously adjusted by the tax authorities, so that, on the one hand, they could temper the consequences of energy price increases and revitalise consumption, and, on the other hand, provide an optimum response to the recently emerged contextual need – that of natural gas savings. Despite a relative improvement of the international climate at the beginning of this year – due both to the reopening of the Chinese market¹⁷ as a result of the relaxation of the measures imposed by the “zero COVID” policy, and to the reduction of energy prices –, the deep negative effects generated by a (still) very high inflation could not be counterbalanced. As such, during the first three months of the year, the high price dynamics continued to represent a major disturbing factor for the performances of the German economy, in the conditions in which the erosion of the purchase power and the continued savings by the population were reflected in a considerable decrease of household final consumption expenditure. The reduction of the propensity for consumption – a direct consequence of the consumers’ reaction to price increases – was reflected in demand for most categories of goods (both essential, and non-essential). Also, the increase of interest rates and the restriction of crediting – as a result of the stricter monetary policy aimed at slowing down inflation – put new pressures on consumption and investments.

In the conditions described, for the first time after the “peak” of the pandemic crisis (year 2020), in Q1/2023, the German economy saw its second consecutive quarterly contraction, which marked its entrance into technical recession (Table 2). After the stagnation noted in the second quarter, the blockages triggered by the combined action of the cyclic vectors we mentioned with the many structural challenges faced, the federal economy entered a new negative territory in Q3/2023.

Table 2: German GDP: quarter-on-quarter percentage changes*, 2021-2023

2021			2022				2023		
Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3**
2.2	0.7	0.0	1.0	-0.1	0.4	-0.4	-0.1	0.0	- 0.1

Notes: * seasonally and calendar adjusted data; ** provisional results;

Source: Destatis (2023).

Although the “peak” of the inflationist wave was overcome and the annual inflation rate began descending since early in the year, it continued to be high and there was no visible downward trend of consumer prices. According to the estimates of German economic analysts (Ifo Institute, 2023), the total CPI inflation

¹⁷ Which favoured the dissipation of bottlenecks currently existing in the supply chains.

will remain at a high level – well above the limit “threshold” of 2% established by the ECB and above the one recorded in the period prior to the energy crisis – until the end of the current year, fuelled both by the continuation of the government measures adopted in order to stimulate consumption, and by the salary increases applied in Q3 to stabilise the available real income of the population. Despite these measures, for reasons related to precaution, the population’s savings rate was relatively slow to decrease, with a more dynamic trend only towards the end of the last quarter of 2023.

The high degree of uncertainty that the ongoing military conflict continues to exercise this year as well on the national and European economic climate, the less alert development pace of the world economy, as well as the still high level of energy prices and of the basic inflation – compared to the period before the onset of the energy shock – will hamper the internal economic development in 2023, despite the tax incentives adopted by the government and which are still in force. More than that, given the German economy’s dependence on exports – e.g., in 2022, exports accounted for over 50% of the GDP –, the slowdown in global demand and the internal imbalances faced by its main trade partners (i.e., China and the U.S.)¹⁸ represent other cyclic factors that will have a negative impact on the federal economic performances this year.

The events occurred during the recent years highlighted the increased risks that arise from the deep unilateral dependence on the supply of intermediate inputs from the external markets. After the occurrence of the Covid-19 pandemic and, afterwards, the conflict initiated by the Russian Federation in Ukraine caused the discontinuation of the supply chain, more recently, the onset of the geopolitical and economic crisis between certain Western States, including the EU Member States, and China, placed the latter at the centre of German debates on the preparation of a new economic strategy that would enable a distancing from the Chinese market. This is due to the fact that, during the recent years, China was the most important source for the German imports of intermediate inputs. A detailed analysis made by Germany’s central bank this year (Deutsche Bundesbank, 2023b) provides a detailed image of the possibilities now available for national companies to reduce the purchase of intermediate products from China. During the surveyed period (April-June 2023), around 29% of German companies purchased critical intermediate products¹⁹ from the Chinese market. The analysis also revealed that approximately 50% of the companies in the German manufacturing industry depend on inputs of Chinese origin for the proper conduct of their production processes. Amount these, 80% reported they would find it “difficult” or “very difficult” to substitute Chinese imports by resorting to other external sources. Overall, companies for which the possibilities of sourcing substitute products are “very difficult” total around 1/4 of the turnover of the German manufacturing sector in 2022.

Against a background governed by instability, uncertainty and risks which, at present, characterises the global economic and geopolitical climate, recently aggravated by the intensified tensions in the Middle East, most forecast reports prepared by national economic research institutes, federal governmental bodies and/or international entities predict that the German economy will contract this year (Chart 4).

2.2. Persistence and deepening of structural deficiencies

In addition to the cyclic aspects detailed in the previous section, Germany also faces a series of structural vulnerabilities which, though not recent, have been brought back to the forefront by the situation created by the shocks of the last three years (i.e., the pandemic crisis followed by the energy crisis).

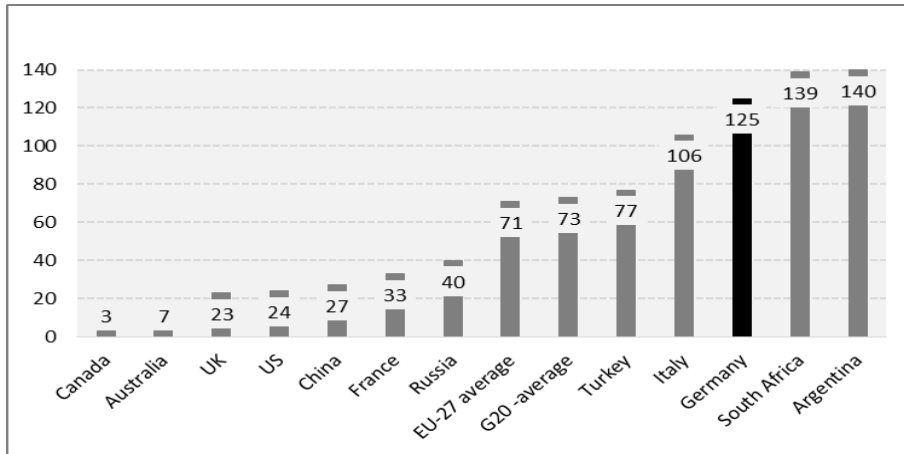
A. Excessive bureaucracy – caused by numerous rules and regulations that hinder the smooth conduct of activities in state institutions, the lack of personnel as well as the insufficient digitalisation of the public sector²⁰ – represent a significant barrier for investments, while also causing increased costs for investing companies. It is worth noting that the length and complexity of procedures required for setting up new companies placed Germany among the most excessive countries worldwide (rank 125) in terms of bureaucratic burden in 2020 (Chart 7).

¹⁸ China was during the last seven years Germany’s main commercial partner (import + export) and the U.S. is the main outlet market for German exports.

¹⁹ Critical intermediate inputs represent that category of goods or services without which an enterprise’s production processes or commercial activities could not be possible or, if possible, it would involve major delays and/or lower quality standards.

²⁰ Although based on a law adopted in 2017, over 550 services were required to be available online by 2020, only 130 of them were digitalised.

Chart 7: Ease of doing business in Germany: starting a business, 2020 ranking



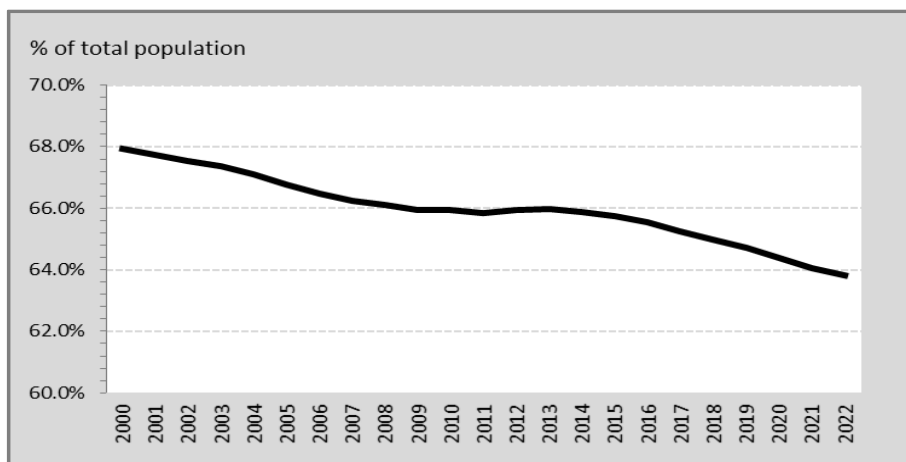
Source: Graphic representation by the author based on the data published by the World Bank (2023).

The strictness of federal regulations makes the starting of a business in Germany a much lengthier process than in other European economies. As such, while it takes around 120 days to obtain the operating licence for a start-up in Germany, in countries such as Italy or Greece, it takes approximately 40 days on average. Also, the time required for obtaining a construction permit is two or three times longer.

B. Major infrastructure deficiencies – as a result of the low public investment during the budget austerity period – which hinder the activity of national companies, generating supply chain blockages. According to a survey conducted by the Institute of German Economy/Cologne (Puls & Schmitz, 2022), 80% of German companies claim that their activity is hindered by the poor state of the internal transport infrastructure (around 20% more than in 2013). Although as early as 2015, the federal government created several investment funds for the transport infrastructure, the amounts are mostly absorbed by high prices of the construction sector. As a consequence, in 2022, the value of inflation-adjusted investments was at the same level as in 2009.

C. The rapid pace of demographic changes and the high level of population ageing have been affecting the German economy for several years, resulting in the reduction of employment (Chart 8) and, implicitly, in a considerable shortage of qualified workers²¹. According to forecasts, the workforce shortage will become increasingly acute during the next decade, once the “baby boomer” generation – which includes the persons born in the time frame 1955-1969 – leaves the labour market and retires (Table 3).

Chart 8: Population of working age* in Germany as percentage of total population, 2000-2022



Note: * The working age population is defined as those aged 15 to 64.

Source: Graphic representation by the author based on the data published by the OEDC (2023).

²¹ According to recent studies, at present, over 40% of the companies in the German industrial sector claim a lack of qualified personnel (Born & Krys, 2023).

Table 3: Number of people at working age in Germany, prognosis until 2070 (million persons)

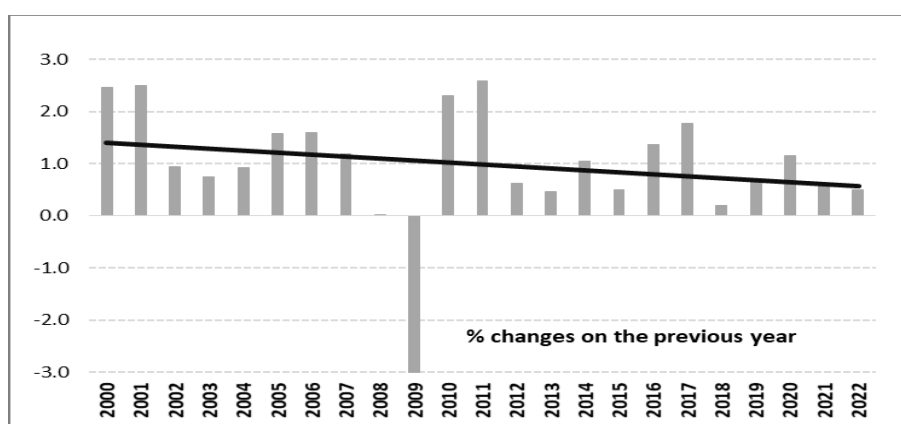
2021	2030	2040	2050	2060	2070
51.4	48.9	46.0	44.5	44.5	41.4

Source: Destatis (2023).

Although Germany is not facing a nationwide shortage of skills, in certain regions and industries, the occupation of vacant positions with qualified personnel has become impossible. In quantitative terms, in the July 2021- July 2022 interval, there were 530,000 vacant positions which could not be occupied because of the lack of qualified persons among the German unemployed.

The increasingly alert pace of population ageing affects individual productivity (Chart 9), because according to statistic evidence it tends to decrease among older workers, in the conditions in which ageing reduces the capacity for innovation and adaptation to the new technologies (Deutsche Bundesbank, 2023b). As a consequence, on the medium term, the demographic decline of the workforce risks endangering the potential productivity of the German economy.

Chart 9: Percentage changes in German labour productivity*, 2000-2022



Note: * Price adjusted GDP per hour worked by persons in employment;

Source: Graphic representation and calculations by the author, based on the data published by Destatis (2023).

In addition to all the structural deficiencies presented above, Germany also faces radical tax burdens, with excessive energy prices caused by the inadequate energy policies adopted in the past, coupled with a high level of political uncertainty. As shown, the interaction between cyclic vectors and the structural issues accumulated and consolidated in time acts as a major obstacle for the future economic development.

However, compared to the erosive factors that were active in the period prior to the economic decline (1998-2005), Germany now has a quite stable employment rate and tax position, which are attributes that facilitate adaptation to shocks. Nevertheless, the current recession may serve as a warning sign for the federal authorities, which should speed up the preparation of the measures comprised in the announced recovery and reform plan centred on several directions of action (Box 1).

Box 1: Several directions of action aimed at helping Germany relaunch its economy and resume its sustainable growth path

1. The reduction of the degree of uncertainty related to the national policy on energy transition and a better use of market forces to drive the transition to a “green” economy. In this sense, government authorities must outline an adequate regulation framework that would enable companies involved to plan their investments accordingly. Because the transition is inevitable for most companies and economic sectors, it is necessary to draft policies focusing on the improvement of framework-conditions, on ensuring the required investments for an adequate supply of cheap and low carbon energy supply, and on promoting research and the development of new products and services with added-value potential;
2. The preparation of an efficient plan enabling the acceleration of the transition to renewable energy, in order to maintain prices at competitive levels and avoid an exodus of companies from the energy intensive industry which have not yet fully resumed production and are currently looking for alternative places to relocate their business;
3. The increase and acceleration of infrastructure investments to maintain and further improve Germany’s attractiveness as a location for business;

4. The acceleration of the public administration digitalisation process, the reduction of regulatory requirements, the streamlining of the current approval procedures, and administrative capacity building in order to stimulate investments;
5. The law on the immigration of qualified workers, which reduces the barriers against the immigration of qualified personnel, is a significant step in the effort to mitigate workforce shortage. In addition, to stimulate internal supply, the German executive is envisaging the implementation of a tax reform and the restructuring of the pension system.

Source: Adaptation and synthesis by the author after Allianz SE (2023) and Born & Krys (2023).

2.3. Is the German economy the “sick man of Europe” (again)? Pros and cons

As we stated at the beginning of this analysis, the current state of the German economy gave rise to contradictory currents of opinion among national and international economic analysts. This is to say that while some of them consider that the current situation in Germany is of a brief and transient nature, other claim that the country has entered a new phase of prolonged decline.

Holger Schmieding – the first economist who called Germany the “sick man of Europe” in 1998 –, this time pleads in favour of the current recession being a temporary one, caused by the contraction of the manufacturing industry in the U.S. and China, in the conditions of an increased dependence of the federal industry on the exports/imports of auxiliary inputs to/from these countries (Schasfoort, 2023). In his opinion, compared to years 1998/1999: a) unemployment is reduced; b) public revenues are more stable than those in other EU-27 MS (Chart 10 and Chart 11), which provides a leeway; and c) the permanent trade surplus could be used to finance an episode of reduced competitiveness.

Chart 10: Year-on-year changes in general budget balance (as % GDP), 2018-2023

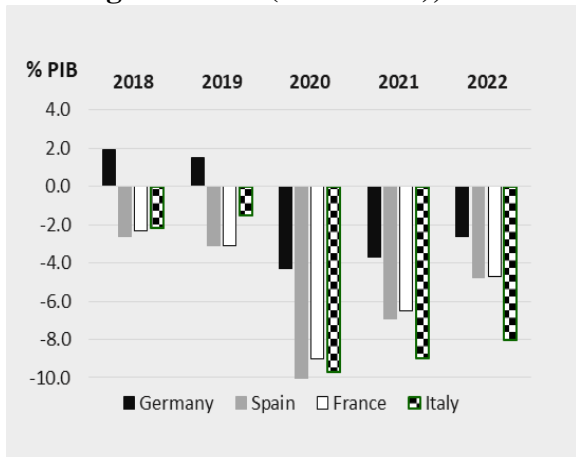
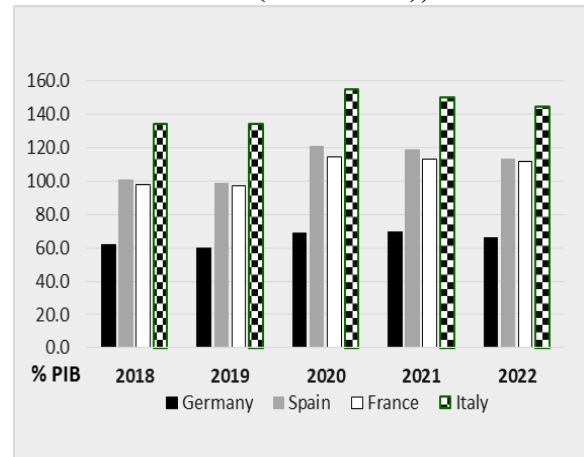


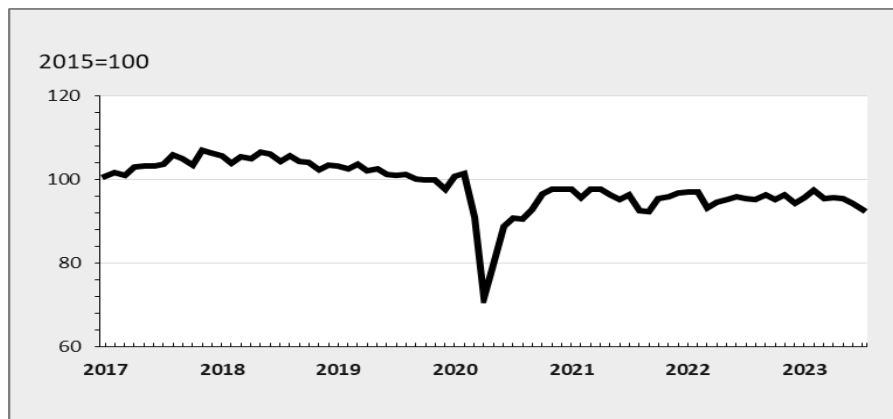
Chart 11: Year-on-year changes in current account balance (as % GDP), 2018-2023



Source: Graphic representation of the author based on the data published by Destatis (2023).

A completely different opinion is outlined by Hans-Werner Sinn (president emeritus of the Institute for Economic Research, IFO), who claims that the decline of the manufacturing industry is not transient – given that it started in 2018, under the impact of the decrease of external demand for the goods produced in the automotive sector –, and continues through 2023, when the German’s industrial production came to be ranked below the level of the pre-pandemic years (Chart 12).

Charts 12: Month-on-month changes in German index of production in manufacturing, 2017-2023



Source: Graphic representation by the author based on the data published by Destatis (2023).

In his vision, the voluntary decision to discontinue the production of nuclear energy, coupled more recently with the cease of gas deliveries from the Russian Federation (2022) had a devastating effect on an economy based on the manufacturing industry (highly energy-intensive) (Sinn, 2023). Sinn also claims that an important risk factor for the manufacturing industry at present is Germany's increase dependence on China (its main commercial partner since 2016). The progressive externalisation of the automotive production beginning in 2016 (due to profit-related reasons), currently exposes German producers to the risk of losing their market share to local competitors. The poor state of the German economy is also caused by a plethora of structural shortcomings which require the recalibration of the German growth model and the reformation of the federal economy.

3. Implications that German's entry into a phase of prolonged decline could have for the European Union states

Being a main contributor to the EU budget – with a around EUR 33.2 billion in 2021 –, an economic contraction in Germany could trigger the reduction of funds intended for the EU revenues. In fact, in June this year, German Finance Minister Christian Lindner declined the European Commission's request for a supplementation by the Member States of the amounts transferred to the UE budget and required for the granting of a new aid package to Ukraine for and paying part of the joint debt. Invoking the country's own financial constraints and the expenditure cuts applied internally to avoid the public finance deficit, Christian Lindner declared that, in the current situation, Germany was unable to subscribe to additional contributions to the Union budget.

Also, the decrease of the productive force of the federal industry would exercise a cascade effect on other EU Member States, given that Germany is the main investor and commercial partner for many of them. In the aftermath of the German reunification and of the fall of communism in Eastern Europe, many small and middle-sized enterprises (*Mittelstand*, considered to be a true “backbone” of the German economy) externalised their activity in the region, producing mainly for the European market. In these conditions, it is evident that a prolonged economic decline in Germany would also have negative consequences in the host countries, risking to endanger the entire regional stability.

As in the previous years, in 2022, Germany was the main trade partner for more than half of the EU-27 Member States: for 16 of them (including Romania), it represented the first export destination, while for 15 (including Romania), it constituted the first source of imports. Also, through the indirect commercial connections, the federal economy is strongly interconnected with all EU states. Implicitly, a prolonged and ample decrease of the federal economic activity – which would cause the reduction of both the internal demand, and the supply on the external market – would generate domino effects.

Finally, the German desynchronization with the rhythm of the other the Eurozone countries would generate major difficulties for the ECB in establishing the optimum monetary policy directions for the entire region.

4. Conclusions

Around 25 years since the German economy was first labelled “the sick man” of the Eurozone on the international stage, the possibility of its re-entering a new phase of severe and lengthy economic decline, which generates the risk of contagion for other EU states has again been brought forward. Unlike the main recession cycle, the main cause of the “disease” this time was the interaction of factors that triggered a “perfect storm” – the Covid-19 pandemic, followed by the Russian-Ukrainian conflict and the subsequent energy crisis –, highlighting the errors in the German growth paradigm centred on export supported entirely by the supply of energy, raw materials and intermediate inputs mainly from two countries with totalitarian regimes (Russian Federation and China). The economic context thus underlined the existence of a series of latent structural deficiencies of the German economy during the recent years (namely, the degraded internal infrastructure, enhanced bureaucracy, slow government services digitalisation process, issues related to demographic aging etc.). The intensified geopolitical tensions brought with them an unequivocal awareness of the risks that arise from cooperating with countries dominated by totalitarian regimes, and this caused decision-makers to take steps to reduce the commercial dependence from China.

All these current realities, coupled with the structural challenges currently faced by Germany, risk endangering the basis of its development model which is export-oriented and based on a strong industrial sector and highly-qualified workforce.

However, despite the imbalances faced at present, Germany has strengths that make it highly resilient to shocks: a) the presence of many small and medium-sized enterprises (*Mittelstand*), with a high capacity for

adaptation; b) healthier public revenues than the majority of developed states, which allow for more leeway, as well as c) a high degree of competitiveness compared to external partners, despite the recently observed losses. To help the economy adapt to a more fragmented international climate, government authorities should implement reforms, but the German political “compass” does not appear to be oriented towards long-term growth, and the members of the governing coalition do not seem to reach a consensus. However, a new growth strategy must be found for 2030, to create the optimum formula for combining international dynamics with a national policy adequate for the current context.

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Between Stability and Sustainability: Nuclear Energy in Romania's Energy Mix

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Abstract: The transition to green energy is a priority of the European Union in fighting climate change and aiming to reach open strategic autonomy, especially today when the world has entered a period of high uncertainty regarding energy security. Since the transition to green energy implies costs, resources, and new technologies, nuclear power generation could represent the buffer between the current situation and the desired one. This paper aims to analyse whether nuclear energy could represent such a buffer for Romania, which still relies on electricity imports due to the variability of internal production, considering our country's advantages in this field, namely resources of uranium and existing nuclear capacities.

Key-Words: - nuclear energy, solar energy, wind energy, sustainability, stability

JEL Classification: C40, F18, Q42

1 Introduction

In 2022, the European Parliament voted to classify nuclear energy as green or sustainable on a proposal from the European Commission (2022) since atomic energy does not directly produce carbon dioxide emissions, ensures energy security, does not cause more harm to human health or the environment than other electricity production technologies already included in the taxonomy, the significance of nuclear industry in Europe and as a political compromise among the Union's member states. The decision has been criticised because of the issues related to nuclear waste management, the high costs of developing new production capacities, and the consequences of the accidents in Chernobyl and Fukushima.

The scientific debate surrounding nuclear energy's viability, safety, and impact is heterogeneous. Some researchers highlight the potential benefits of atomic energy, while others underscore the looming threats and challenges.

Supersperger et al. (2011) consider nuclear power unreliable, expensive, and unsafe for the North African countries that would remain dependent on imports to produce nuclear energy. Renewable energy is a better solution because it allows North African nations to build and maintain their infrastructure.

Naimoğlu (2022) analysed the impact of Nuclear Energy Consumption (NEC) and energy imports on CO₂ emissions in 10 emerging economies from 1990-2019, confirming the Environmental Kuznets Curve (EKC) hypothesis. The findings underlined the potential of nuclear energy to reduce pollution, the significance of renewable energy for environmental quality, and the need for technological advancements in energy efficiency.

Rotblat (1978) argues that the push towards nuclear energy increases the risk of nuclear warfare due to the widespread availability of plutonium while creating an imbalance of power, where developing countries become heavily dependent on more prosperous nations for nuclear resources. The author suggests that the ideal solution is to focus on alternative, renewable energy sources, like solar, to gain energy independence and minimise the risks of nuclear energy.

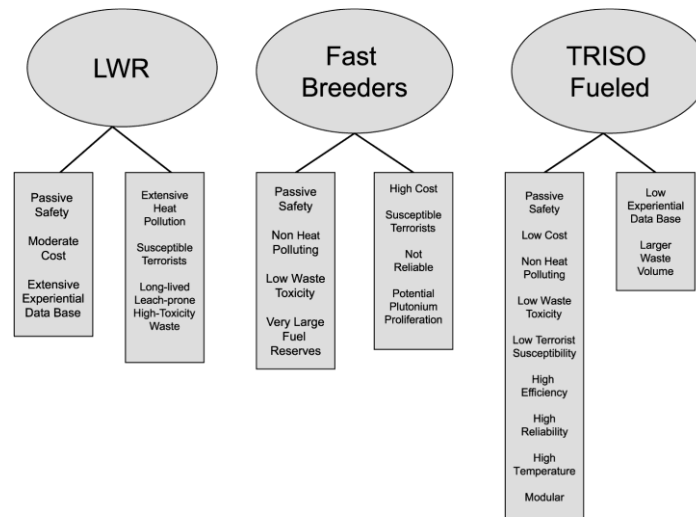
According to Heffron and Nuttall (2017), Scotland's energy debate focuses mainly on nuclear and renewable energy, while the country relies mostly on fossil fuels. If Scotland becomes a member of the EU, it may have to shut down its fossil fuel power plants due to EU regulations and agreements. The Scottish Government promotes renewable and fossil fuels, neglecting nuclear energy.

Hollomon et al. (1975) argue that a nuclear plant can displace 2.5 times its energy output in oil equivalents compared to an oil-fired plant due to the inefficiency of converting oil into electricity. When considering future demand and accounting for energy inputs in constructing nuclear and oil-fired plants, atomic energy can displace even more oil. The exact amount depends on the parameters of the oil system, with the displacement from the first case serving as a minimum estimate.

According to Yi-Chong (2011), Australia could increase its uranium exports due to Asia's growing nuclear power industry. Australia must strengthen the Nuclear Non-Proliferation Treaty framework to ensure safety and improve its protection measures, especially in the region. Australia's approach to nuclear fuel and used fuel management needs careful consideration, with an emphasis on regional cooperation and skill development.

Schaffer (2007) analyses the advantages and disadvantages of three types of nuclear reactors: light water reactors (LWR), fast breeders and TRISO. The LWRs offer passive safety, moderate cost and an extensive experiential database but suffer from extensive heat pollution and are susceptible to terrorist threats. Fast breeders also provide passive protection and produce low waste but are costly, unreliable, and vulnerable to terrorism. TRISO-fueled reactors have passive safety, low cost, and non-heat polluting features but have an insufficient experiential database, producing a larger volume of waste (Figure 1).

Figure 1: Principal reactors advantages and disadvantages



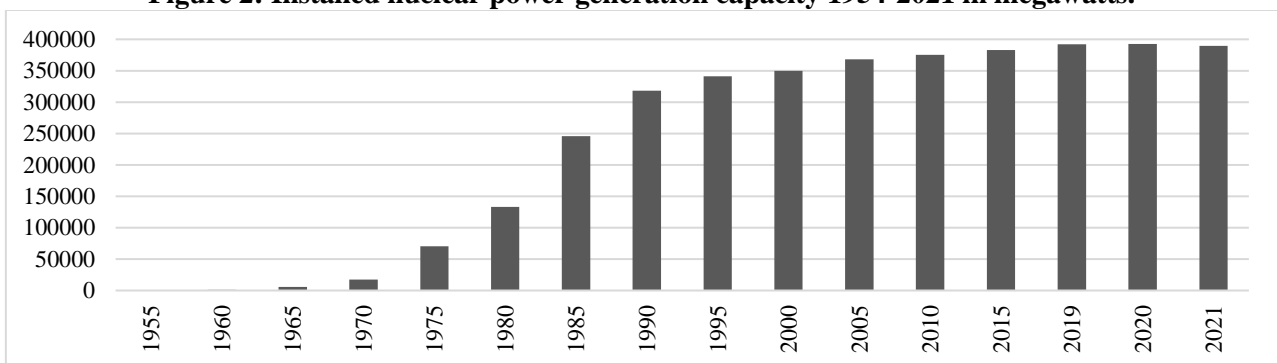
Source: Schaffer (2007)

The EU considers nuclear energy transitional between fossil fuels and green energy sources. Such transition can provide stable and reliable baseload power, essential for stabilising the grid while renewable sources are being integrated. However, it poses significant challenges, particularly regarding safety and waste disposal. Therefore, adopting a comprehensive approach that includes new green energy sources, technological advancements, strict regulations, and international cooperation is crucial to ensure its effective and safe use.

2 Zooming out nuclear energy

Worldwide, installed nuclear power generation capacity grew rapidly between 1955 and 1990, from five gigawatts in 1955 to 318,253 megawatts in 1990. Afterwards, the development was slower due to various factors, such as safety concerns, economic challenges, regulatory changes, and competition from alternative energy sources, in the context of the transition to the green economy (Figure 2).

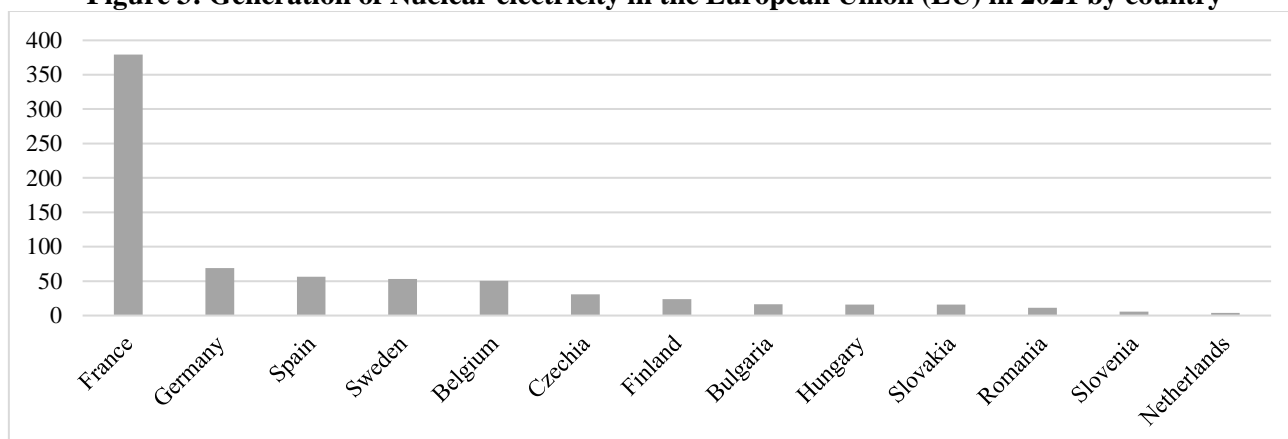
Figure 2: Installed nuclear power generation capacity 1954-2021 in megawatts.



Source: Statista (2023a).

The capacity peaked in 2020 (392,612 megawatts), entering a decline in 2021 (389,508 megawatts). In the EU (Figure 3), the largest producer of nuclear power in 2021 was France (379.4 terawatt-hours), followed by Germany (69 terawatt-hours) and Spain (56.6 terawatt-hours).

Figure 3: Generation of Nuclear electricity in the European Union (EU) in 2021 by country



Source: Statista (2023b).

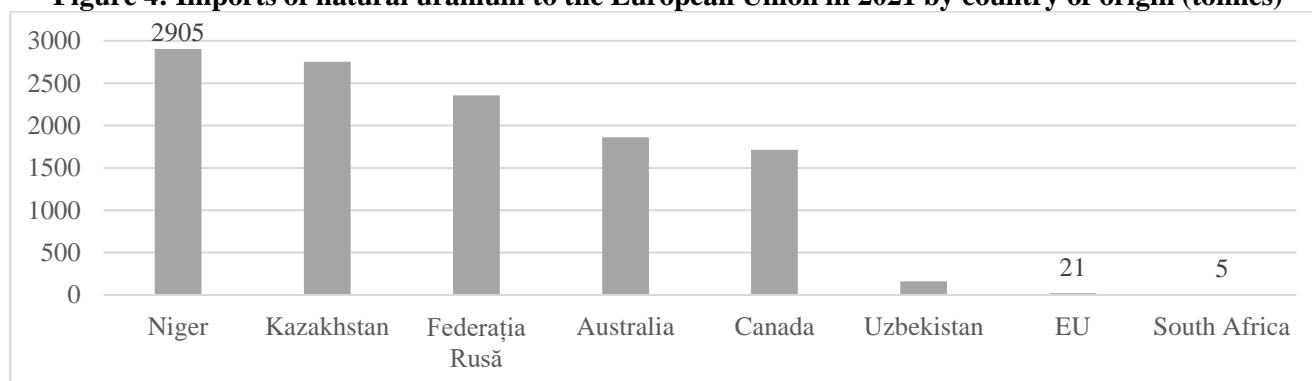
Romania produced 11.3 terawatt-hours of nuclear electricity, while Slovenia produced 5.7 and the Netherlands 3.8.

Regarding raw materials for nuclear fuel, the EU depends on imports.

According to Statista (2023c), the EU's leading source of natural uranium is Niger, from which it imported a total of 2,905 tonnes in 2021, followed by Kazakhstan (2,753 tonnes of natural uranium) and Russia (2,358 tonnes). Smaller quantities (Figure 4) were imported from Australia (1,860 tonnes), Canada (1,714 tonnes) and Uzbekistan (162 tonnes).

Only 21 tonnes of natural uranium is supplied from within the EU, a negligible contribution to domestic consumption needs. The EU also imports 5 tonnes of natural uranium from South Africa and a further 17 tonnes from sources not identified in the statistics.

Figure 4: Imports of natural uranium to the European Union in 2021 by country of origin (tonnes)



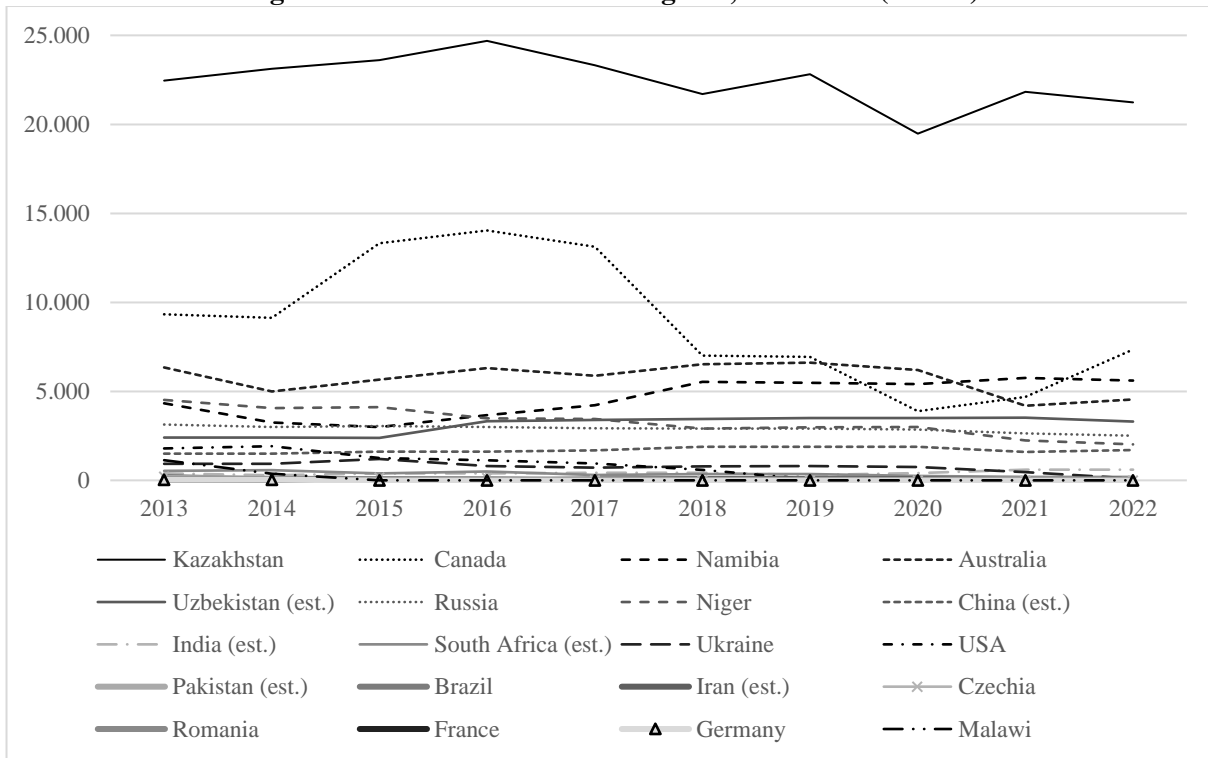
Source: Statista (2023c).

The analysis of the level of production of natural uranium exporting countries and EU imports (Figures 4 and 5) reveals that in 2021 the EU imports from Niger exceeded the output of that year (129.23%) and some stocks from previous years. The tensions in Niger this year could have a very negative impact on nuclear energy in the EU.

From the Russian Federation EU imported 89.5% of its production in 2021, from Australia (44.37%), from Canada 35.5%, from Kazakhstan (12.62%) and from South Africa (2.60%).

According to the data provided by the World Nuclear Association (2023), in 2013, only a few European countries produced uranium (Figure 5), namely Czechia (215 tonnes), Romania (77 tonnes), France (5 tonnes), and Germany (27 tonnes).

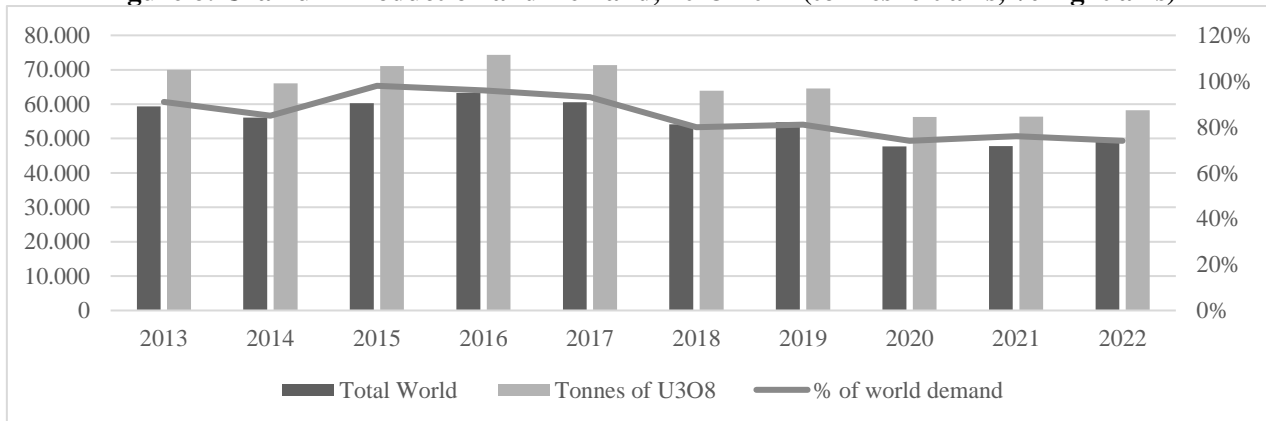
Figure 5: Uranium Production Figures, 2013-2022 (tonnes)



Sursa: World Nuclear Association (2023).

In 2016, only Czechia (138 tonnes) and Romania (50 tonnes) were still listed with natural uranium production. Since that year, no EU country has had any domestic production.

Figure 6: Uranium Production and Demand, 2013-2022 (tonnes left axis, % right axis)



Sursa: World Nuclear Association (2023).

A significant point is that in 2022, total natural uranium production only supplied 74% of the world's demand (Figure 6). Therefore, no global equilibrium exists between supply and demand, with countries competing for domestic requirements.

Considering the uncertainties regarding the uranium supplies from Niger and the war in Ukraine that led to the sanctions against Russia, in order to ensure its uranium imports, the EU needs to diversify its sources of natural uranium supply in a highly competitive market.

Since the EU is looking for open strategic autonomy, in the case of nuclear resources, the picture could be promising, looking at the resources available within the Union, and a more diversified sources of imports. Regarding the European uranium identified recoverable resources (Table 1), Czechia ranks first with (120,000 tonnes), followed by Spain (93,600 tonnes) and Slovakia (43,700 tonnes). Portugal has (18,500 tonnes), Italy (18,300), Hungary (13,500), Romania (13,200). The lowest resources of uranium have Slovenia (7,600 tonnes), Germany (7000), Greece (7000) and Finland (2,400 tonnes).

Table 1. Identified recoverable resources in the EU*
(as of 1 January 2019, tonnes U, rounded to nearest 100 tonnes)

Country	<USD 40/kgU	<USD 80/kgU	<USD 130/kgU	<USD 260/kgU
Czechia	-	-	900	119200
Finland	-	-	1200	1200
Germany	-	-	-	7000
Greece	-	-	-	7000
Hungary	-	-	-	13500
Italy	-	6100	6100	6100
Portugal	-	4500	7000	7000
Romania	-	-	6600	6600
Slovakia	-	12700	15500	15500
Slovenia	-	-	-	7600
Spain	8100	28500	28500	28500
Total	8100	51800	65800	219200

Source: IAEA, NEA (2020).

* It refers to the quantity of uranium that has been discovered and is considered technically and economically feasible to extract with the existing technology and under current market conditions.

The EU imports in 2021 amounted to 11,795 metric tonnes (Statista, 2023c), and the total uranium resources discovered and extractable in the Union are around 344,900 metric tonnes, representing the demand in 2021 for 29 years on. Under these conditions, and current production capacities, nuclear power production could be an actual buffer in the transition to entirely green energy, until new clean technologies will be able to replace it.

2 Analysing nuclear energy's importance in Romania's energy mix.

To analyse the importance of nuclear energy in Romania, we selected a data set comprising the energy production in Romania by sources on the 15th of October 2023, during the day, so all the energy sources are included in the research. The data is available on the webpage of Transelectrica, the Romanian Transmission and System Operator, which plays a vital role in the Romanian electricity market (Table 2).

Table 2: The production of electricity in Romania by source, in Megawatts, 15th of October 2023
Daylight

Coal	Hydrocarbons	Water	Nuclear	Wind	Solar	Biomass	Balance*
781	1147	1150	1385	792	4	49	-508
818	1118	1114	1389	794	4	48	-530
825	1135	1142	1385	783	9	49	-511
818	1117	1155	1383	786	17	49	-467
820	1125	1151	1383	805	35	50	-434
864	1125	1131	1384	834	57	49	-490
892	1133	1141	1386	811	82	50	-479
912	1131	1114	1389	780	105	48	-483
906	1120	1099	1388	756	133	50	-535
916	1129	1103	1391	704	157	50	-512
941	1137	1133	1396	675	191	51	-525
934	1138	1116	1394	635	215	52	-660
941	1139	1143	1392	573	243	51	-647
934	1143	1140	1390	527	269	51	-594
940	1140	1143	1389	480	283	51	-481
941	1146	1144	1393	443	314	49	-548
941	1146	1144	1393	443	314	49	-548
943	1173	1171	1390	417	374	50	-721

Coal	Hydrocarbons	Water	Nuclear	Wind	Solar	Biomass	Balance*
938	1166	1169	1387	420	398	51	-742
928	1160	1130	1390	413	419	50	-754
907	1152	1097	1389	413	426	50	-702
904	1133	1025	1390	415	443	50	-633
930	1152	1165	1391	404	453	49	-815
933	1159	1175	1390	396	479	48	-893
929	1149	1169	1392	391	475	48	-939
931	1154	1173	1391	400	485	51	-506
928	1153	1188	1393	403	509	49	-921
917	1146	1138	1391	421	515	50	-900
930	1159	1215	1394	434	528	49	-1055
935	1155	1191	1391	445	545	49	-994
931	1150	1188	1388	449	565	48	-1055
927	1149	1187	1391	485	553	48	-1044
925	1146	1165	1392	503	561	46	-994
911	1138	1113	1391	498	561	48	-958
907	1117	1107	1389	507	558	49	-976
918	1125	1177	1393	510	547	49	-1009
918	1129	1186	1388	497	541	49	-945
922	1118	1182	1394	496	529	49	-899
912	1115	1154	1393	502	531	48	-862
900	1102	1095	1391	527	522	47	-831
881	1109	1104	1390	547	507	47	-864
903	1121	1180	1390	551	496	47	-925
903	1126	1186	1391	543	499	48	-947
888	1111	1136	1389	565	492	48	-873
878	1102	1099	1393	580	464	46	-763
884	1106	1122	1394	584	453	47	-861
870	1111	1149	1393	577	429	47	-776
899	1118	1183	1390	600	402	48	-836
906	1127	1195	1388	603	394	48	-751
902	1117	1189	1393	641	359	48	-779
902	1122	1199	1392	709	328	49	-784
897	1116	1223	1389	749	304	49	-864
925	1129	1208	1391	742	293	49	-766
916	1127	1189	1390	772	272	48	-732
921	1121	1181	1391	797	256	47	-576
927	1131	1209	1394	831	228	48	-621
927	1138	1219	1393	846	189	48	-573
925	1146	1219	1391	871	171	47	-583
921	1147	1198	1391	923	141	48	-551
894	1117	1078	1389	945	117	47	-257

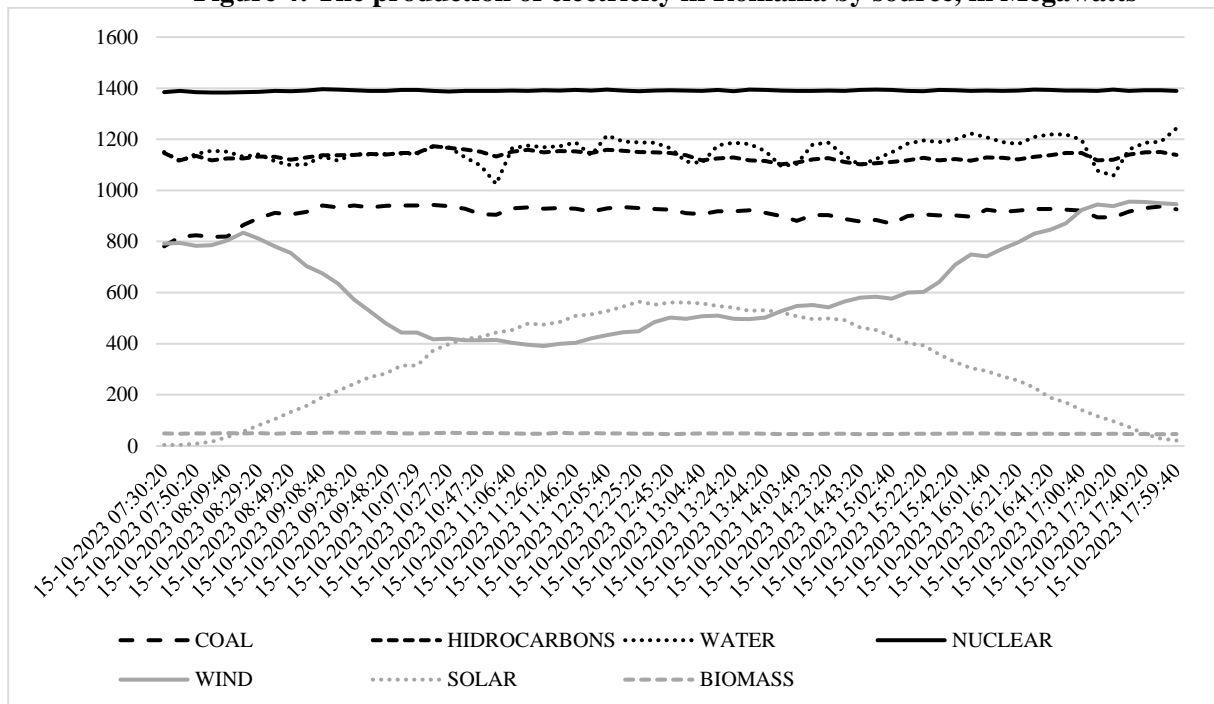
Coal	Hydrocarbons	Water	Nuclear	Wind	Solar	Biomass	Balance*
895	1120	1058	1394	938	96	48	-270
917	1140	1160	1390	956	74	47	-322
931	1149	1186	1392	955	46	47	-255
937	1150	1190	1392	950	29	46	-188
926	1139	1243	1389	946	22	47	-274

Source: Transelectrica (2023).

*Balance is the difference between consumption and production.

To better understand the selected data, we generated Figure 4 to visually represent each source.

Figure 4: The production of electricity in Romania by source, in Megawatts



Source: Transelectrica (2023).

Figure 4 represents the energy production from various sources over the day of 15th October 2003, during the day. The nuclear source was the most stable energy production, remaining relatively constant over the analysed time. It has the highest average production (1390 MW) and a very low standard deviation (3 MW), indicating a very stable and consistent energy production (Table 3). On the 15th of October 2023, the nuclear source accounted for 25% of the total production, followed by water (21%), and hydrocarbons (20%). Wind energy represented only 11% of the total production, while solar just 6% and biomass 1%.

Table 3: Descriptive statistics

Descriptive statistics	Coal	Hydrocarbons	Water	Nuclear	Wind	Solar	Biomass
Mean	908	1134	1156	1390	626	323	49
Standard Deviation	34	16	42	3	181	187	1
Minimum	781	1102	1025	1383	391	4	46
Maximum	943	1173	1243	1396	956	565	52
Sum	59023	73709	75126	90378	40688	21010	3160
Count	65	65	65	65	65	65	65

Source: Author's calculation.

Hydrocarbons and hydropower show a bit more variation in energy production. Hydrocarbons seem to decrease slightly, while water has some fluctuations but is generally stable. Wind and Solar show the most variation and instability in energy production. The energy production from these sources is lower than the others, and their outputs fluctuate more frequently and with greater intensity.

Considering stability, coal and nuclear sources are the most consistent. Regarding variability or fluctuation, wind and solar affect total energy production more due to their less predictable energy outputs. Regarding environmental impacts, hydrocarbons would have a considerable effect due to emissions, while wind and solar would have less environmental impact.

To improve the variability of the energy supply, it is important to address the unpredictability of wind and solar sources through energy storage solutions or better grid management.

4 Conclusion

Nuclear energy is a significant component of the national energy mix due to its stability and low carbon footprint.

Given Romania's existing nuclear facilities and domestic uranium resources, nuclear power could be a reliable baseline energy source, reducing dependency on energy imports, considering the variability in production from renewable sources such as wind and solar, which still need to provide consistent outputs.

However, the reliance on nuclear energy has its challenges.

Since the internal uranium production in the European Union is insufficient to meet the demand, the member states should diversify their uranium supply in a very competitive market affected by instability and conflicts in some of the significant uranium-producing countries or produce it internally, given the identified and recoverable resources in the member states.

Even though nuclear power is considered green, there are still challenges regarding the used fuel and the high costs of developing new nuclear power capacities that need to be addressed by the EU when setting new atomic capacities.

Considering the pros and cons, nuclear energy can be a significant buffer in the transition towards the green that could be aligned with the Union's goal of reaching open strategic autonomy and environmental sustainability.

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Challenges for Social Entrepreneurship

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Abstract: In recent years, several European countries have approved specific laws to regulate social entrepreneurship. The analysis of the legislation is important in the study of social entrepreneurship because the legislation brings with it specific opportunities and risks. There is a diversity of possible situations in which knowledge of the law avoids material costs, time, or brings opportunities, such as those provided for in the new tax code for social enterprises provided for by the law of the social economy, but also for the other actors of the social economy. Following the evolution of recent years, social entrepreneurship continues to be a sector that has not been fully fruitful, although around the world, many governments have developed policies and strategies to support the development of social enterprise, but they remain fragmented in most member states. It is known that social enterprises are particularly effective in the development of rural regions. This is because they support the establishment of entrepreneurial ecosystems and sustainable development models. In our presentation we aim to reinforce the principles according to which Social Entrepreneurship is a practical, innovative and sustainable type of business that benefits society in general, focusing its attention on marginalized groups in society.

Keywords: social economy, nonprofit organizations, social entrepreneurship, social enterprises, entrepreneurial opportunity

1. Introduction

According to reports and studies, there are approximately 11 million social enterprises worldwide. At the level of European institutions, the term social economy began to be used since 1989. In Europe there are institutions with an impact on the social economy, the European Commission, the European Economic and Social Committee, the European Parliament and the Council of Europe, but there are no regulations for a budget policy of financing the social economy. The main instrument for financing activities specific to the social economy is the European Social Fund.

The European Commission, the World Social Enterprise Forum (SEWF) and the Organization for Economic Co-operation and Development (OECD) have made an important contribution to the development of inclusive national policies and the involvement of the private sector, this leads us to look positively at the future social entrepreneurship. The European Commission has defined a social enterprise as an operator in the social economy whose main objective is to produce a social impact rather than making profit for owners or shareholders. It offers goods and services for the market in an entrepreneurial and creative way and uses the profit to achieve social goals (CE, 2013, 3).

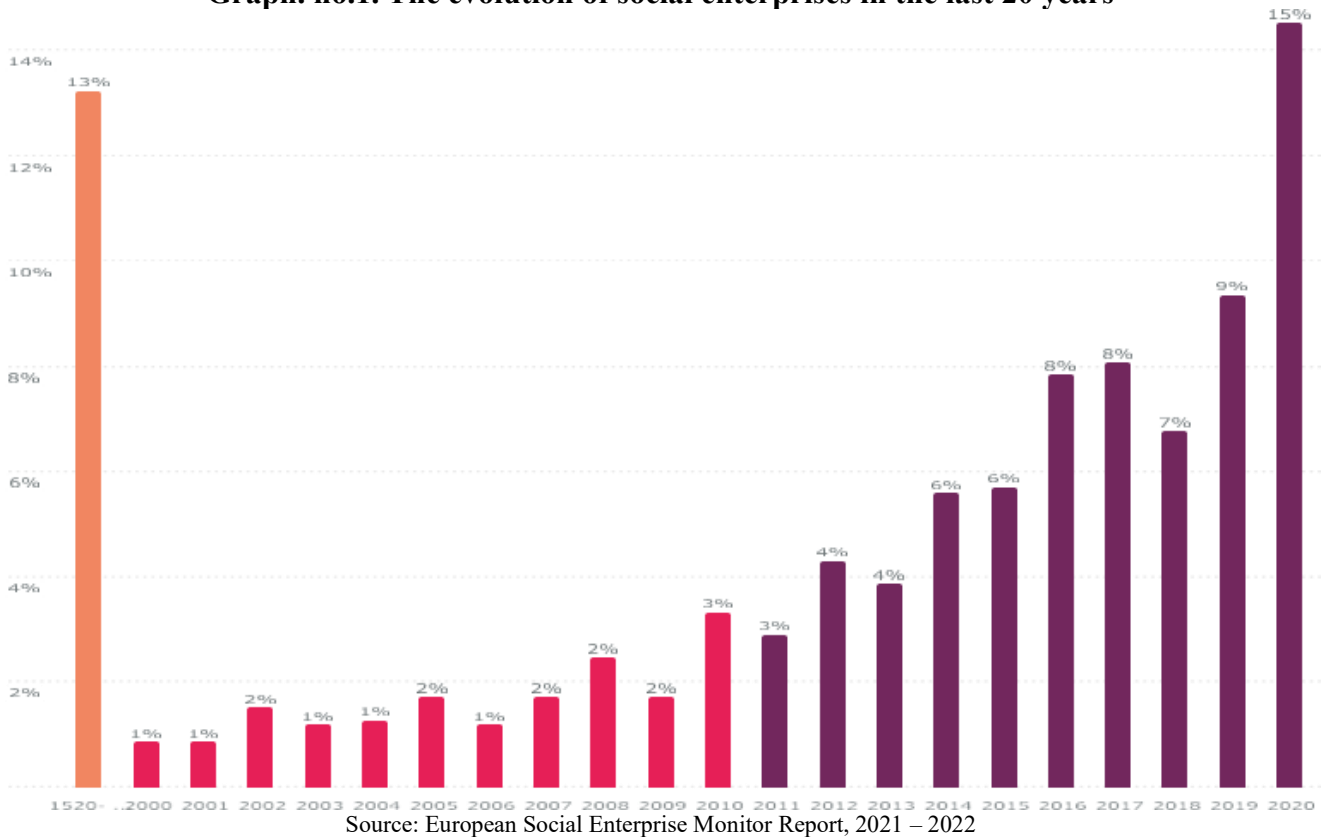
Social enterprises take various legal forms in different countries within Europe. A careful analysis of the legal structures and legislation of European countries that have adopted national laws to regulate social enterprises (for example: France, Belgium, Finland, Italy, Poland, Portugal and Great Britain) shows that these laws address common issues such as the definition of the enterprise social, asset allocation; stakeholders and governance systems; responsibility towards internal and external stakeholders (OECD/EC, 2013, 3).

These laws have generally addressed (or failed to address) some key issues such as: what is the definition of social enterprise as distinct from nonprofit organizations? what is the distribution of resources according to entrepreneurial methods and according to the social nature of the enterprise? how to identify the stakeholders and

the governance structure of the enterprise? how to establish accountability principles and mechanisms not only within the social enterprise, but which also allow the provision of sufficient information to third parties. (Noya, 2009, 15).

According to a definition of social enterprise as proposed by the Social Business Initiative of the European Commission, COM (2011): "a social enterprise is an operator in the social economy whose main objective is to have a social impact rather than to bring profit to the owners or shareholders" (IES, 2014, 9).

Graph. no.1. The evolution of social enterprises in the last 20 years



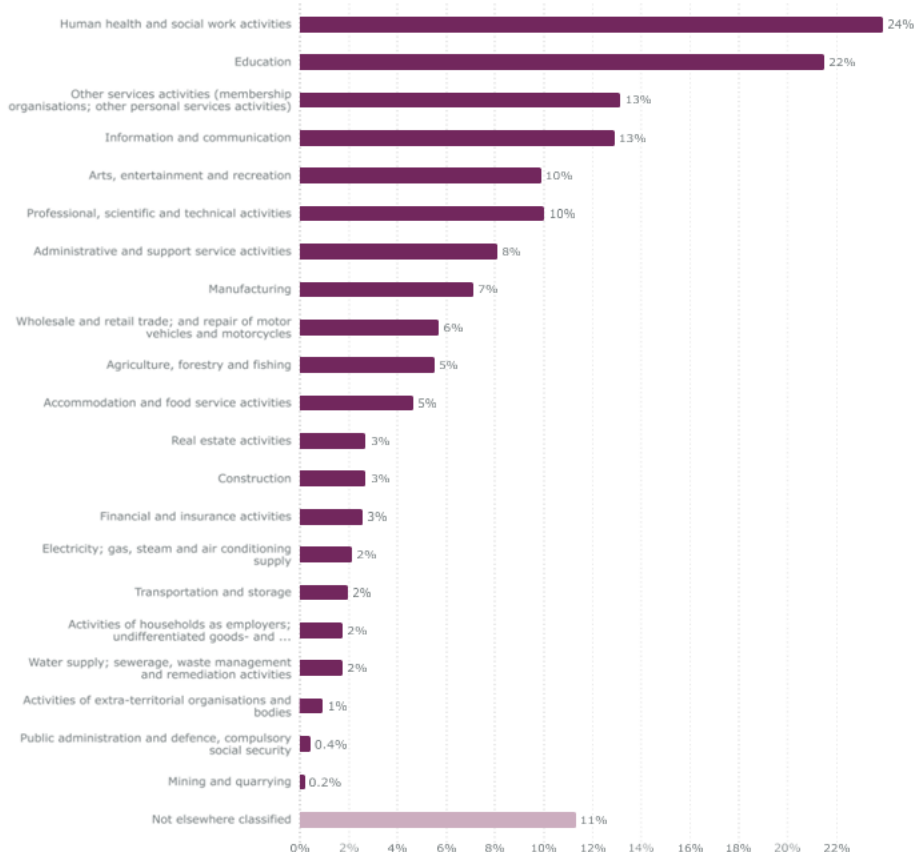
In recent years, faced with multiple social, economic and environmental crises, an increasing number of countries are discovering the high value potential of the concept of social entrepreneurship, which is reflected in the number of social enterprises that have appeared. In most countries, social enterprise founders are between the ages of 25 and 44.

The social enterprise operates by providing goods and services for the market in an entrepreneurial and innovative manner and uses its profits mainly to achieve its social objectives (IES, 2014, 9). In the EU's view, the distinctive feature of a social enterprise is the social purpose combined with the entrepreneurial spirit of the private sector (Bibu, 2008, 78).

Similarly, the OECD defines social enterprises as any private activity conducted in the public interest organized with an entrepreneurial strategy, but whose purpose is not profit maximization, but the achievement of certain economic and social goals and which has the ability to bring innovative solutions to social problems of exclusion and unemployment (OECD, 1999).

Social enterprises operate in all sectors of activity as classified by the International Classification of Business Sectors. According to recent studies, the largest share of social enterprises is found in the Social Assistance Activities and Education sectors.

Graph. no. 2. Number of social enterprises by activity sector



Source: European Social Enterprise Monitor Report, 2021 – 2022

Although they operate in most sectors of activity, studies show that one in ten social enterprises operate in sectors that are not found in the International Classification of Business Sectors. Work integration activities can be identified that cover single-purpose activities (training and employment for a single target group) to integrated multifunctional activities that carry out training, temporary and permanent employment, placement services and support for placements within mainstream organizations.

Social enterprises have a high impact on socially disadvantaged people and those who do not have the financial means to pay the market price for various products and/or services. With the help of innovative offers and hybrid financing models, social enterprises create added value for people that conventional companies do not necessarily perceive as profitable.

2. Commercial entrepreneurship versus social entrepreneurship

Entrepreneurship consists of making strategic resource allocation decisions, including elements such as sensing opportunities, comparing opportunities, combining factors of production to capitalize on an opportunity (for example, designing a new technology or designing and launching a new company), etc.

Management consists of making decisions about the most efficient allocation of available scarce resources within a combination of resources already engaged in the pursuit of an opportunity or set of opportunities. An entrepreneurial opportunity lies in the unmet needs of others.

Entrepreneurship and the entire economic activity consists in identifying one or some social needs and satisfying them better and better. It is often assumed, simplistically, that the entrepreneur is motivated solely by money. However, studies show that the motivations are actually more diverse and that there are rarely cases where the only motivation is financial. It is true that profit is the necessary condition for the survival of any business, but many other businesses contain a significant component of passion and involvement of those who initiated them and do not exclusively pursue profit.

A social enterprise obtains its resources through commercial exchange. The social enterprise is not primarily financed by donations, but by the sale of goods and services, even if they have a price below the market price. The social enterprise does not only donate, but more, it exchanges, sells and buys. In this case, profit is the

main fuel of the social mission. About 57% of Social enterprises use mixed sources of income, i.e. they earn income from both commercial and non-commercial activities.

The sources of income for social enterprises are constituted as follows: 43% of income comes from non-commercial activities (grants, volunteering, donations, etc.) and 57% of income comes from the sale of products and services. The specific difference compared to all other entities is given by the social purpose of the enterprises that form the social economy, thus we identify the fact that organizations active in the social economy have among their main goals the eradication or amelioration of poverty, the protection of the environment, the integration of marginalized people, etc.

The most widespread perception of social entrepreneurship, a widespread perception also in the Romanian space, is that social entrepreneurship uses business principles, entrepreneurial and managerial skills to solve social problems. Social entrepreneurship would pursue a social goal through commercial, entrepreneurial and managerial means.

In essence, the social purpose paradigm proposes to distinguish social entrepreneurship from commercial entrepreneurship by purpose. The difference between the social enterprise and the commercial one is mainly related to the main goals of the two enterprises. The first has a social purpose, the last a commercial purpose. As for the social purpose, this means a diversity of social problems that nonprofits want to solve.

The commercial goal most often mentioned in the social entrepreneurship literature is the profit goal, which often appears in the form of "profit maximization". The purpose of social entrepreneurs is to create social value, to transform the world into a better place, the key difference between social and commercial enterprise would be that social entrepreneurs have an explicit social mission. Profit is not the defining element in social entrepreneurship, but the main driver of social enterprise is the social purpose.

The performance of a social enterprise is measured on two levels. The first is that of the business it carries out, a field in which the indicators used are the usual ones used by any company. The second plan is the social one; here the social impact and the efficiency of its realization are measured.

It follows that the social entrepreneur has to identify two different types of opportunities, which can be more or less related to each other:

The set of individuals he wants to help (group, community or social category) and their needs (most often, the need for income, but also the needs for personal development or others). This is the social problem that will be addressed by the social mission. It may or may not be an opportunity at the same time.

The needs of others (other than those helped) that the former can directly or indirectly satisfy, which represents the economic potential of the individuals, group, community or category that the social entrepreneur wants to help. This is the economic opportunity or mission. It includes the key entrepreneurial combination of what potential consumers need and what potential producers can provide.

3. The role of social entrepreneurship

Social entrepreneurship offers means that facilitate social inclusion and the construction of social, economic and political capital among beneficiaries (K'adamawe, 2013, 74). Failure to fulfill this mission can result in increased crime and violence, continued social exclusion, and an opportunity for people with ill intentions to use social programs as a means to strengthen their control over those communities.(K'adamawe, 2013, 74).

Social entrepreneurship comes as a response to social problems: unemployment, poverty, community fragmentation, etc. Its purpose is to solve or alleviate the problems of disadvantaged populations by increasing their autonomy, innovation and financial independence.

Social entrepreneurship is therefore a combination of social mission and commercial approach: aiming to solve a specific social problem, social entrepreneurs attract resources to achieve their mission, obtaining income from such activities. Social entrepreneurship is a symbiosis between charity and business to solve social problems - it borrows from charity the social goal and from the business sphere the entrepreneurial approach (Kostetska, 2014, 571).

Social entrepreneurs have innovative approaches that are unusual for standard solutions to complex social problems such as poverty reduction, energy conservation, environmental protection, education, health, housing (Kostetska, 2014, 572).

Therefore, social entrepreneurship is social because it solves or at least aims to solve social problems. Social enterprise solves the problems of vulnerable, marginalized groups.

Social entrepreneurship is characterized by values and ethical responsibilities towards local communities because the primary objective of the social enterprise is not profit, but a social or ecological goal such as job creation, training, education, local services or things related to environmental conservation (Licite, 2010, 266).

Companies that have CSR policies focus on profit; they engage only marginally in philanthropic activities. Moreover, these social activities are subordinated to the objective of profit maximization. CSR activities enter the business plan and help build a company's reputation, while the role of the social entrepreneur is to identify social problems and provide innovative solutions for them (Dobele, 2011a, 102).

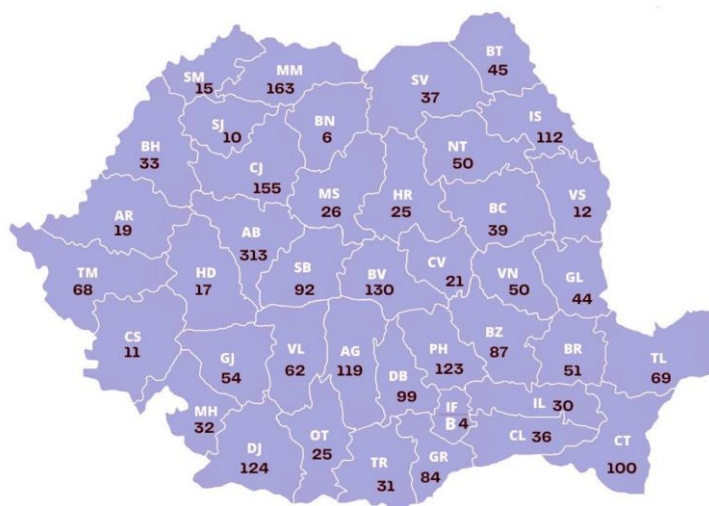
It is true that both companies and social enterprises have both economic and social goals. A multinational can run social programs, for example through CSR policies. An NGO can engage in economic activities and obtain profit. The difference between a social enterprise and a company will be given by the priority of the social purpose in social enterprises. In a commercial enterprise the commercial purpose, profit maximization is the priority. In a social enterprise, the social purpose is a priority. Although the social enterprise and/or a non-profit organization may pursue the goal of profit, this goal is subordinate to the social goal. Social activities in companies are not prioritized in relation to the goal of profit maximization.

Therefore, multinationals would not be social enterprises. The social purpose of this organization would be subordinated to the commercial purpose. The difference between the two types of organizations - social enterprises and commercial enterprises - will be given by the hierarchy of goals. In social enterprises, the social purpose is a priority. Social entrepreneurs differ from social ones by their priority objectives: profit and social wealth (Estrin, 2013, 481).

The fundamental motivation in social entrepreneurship is to create social value, rather than personal or shareholder wealth (Robles, 2013, 395). According to commercial logic, the purpose of an organization is to sell products and services to generate profit (Pache, 2012, 498). For Santos, 2009 in corporations, no matter how socially responsible they are, profit maximization remains the ultimate goal and is directed towards shareholders. The concept of social economy has a longer history and is recognized in countries such as Spain, France, Portugal, Belgium and Luxembourg, and less recognized in the rest of Europe.

In Romania at the beginning of 2023, 2,623 social enterprises were active out of the total of 2,904 social enterprises registered in the National Registry of Social Enterprises. A total of 7,208 employees work within them, of which 560 employees come from vulnerable groups.

Graph.no.3. Distribution of social enterprises in Romania



Source: ANOFM Romania

The social economy represents 10% of all enterprises at European level, which means 2 million structures, which employ over 20 million people, representing 10% of all jobs.

Approximately 44% of the social enterprises operate most frequently at the local/city level, followed by the social enterprises with activity at the national level with a percentage of 41%, the remaining 33% operate at the community/neighborhood level. The tendency of social enterprises is to operate exclusively on the market in the country where they are based, 67% of them, 15% of social enterprises operate at European level and 20% operate at international level, outside the borders of Europe. Only 7% operate at all three levels, namely national, European and international.

4. Conclusions

Social entrepreneurship is innovative, but this innovation is not something radically different from existing structures, but rather is built on the current practice of nonprofit organizations. Social enterprises around the world are often young organizations. The average year of establishment in all countries is 2010. In Europe we find the newest social enterprises, while in regions such as Pakistan and Sri Lanka social enterprises are older. In most countries, social enterprise founders are between the ages of 25 and 44 and tend to be led by women, promoting gender equality. There are still considerable gaps in awareness, visibility and understanding that need to be addressed so that social entrepreneurs can fully influence the role in the transformation towards a just and green society and economy.

We can conclude that in Europe social enterprises are policy tools effectively used to reduce territorial disparities, to stimulate economic growth, the employment capacity of vulnerable social groups, to improve the performance of regional development policies and programs.

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Analysis of the Risk of Fraud in Projects Financed from European Funds

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Abstract: The European funds represent a source of non-refundable financing allocated to the EU member states, in order to reduce the economic and social development gaps between them. Funding from the EU is dedicated especially for the fields that generate the highest added value in the EU economy, and the allocations at the level of each member state are negotiated with the European Commission. Unfortunately, however, a number of irregularities or even frauds also appear in the allocation and implementation of European funds. This paper aims to analyze the risk of fraud in projects financed from European funds and the measures that can be adopted to reduce the financial corrections applied in the case of irregularities found in the use of European funds.

Key-Words: - European funds, fraud, OLAF, shared management, anti-fraud.

1 Introduction

In order to carry out this paper, a series of reports of institutions with authority in the field of financial and tax fraud investigation which could affect the financial interests of the European Union in Romania, were analyzed. This paper is a presentation and analysis of how the risk of fraud with European funds is managed, both by international institutions and by Romanian institutions.

At the European level, in 1999, on April 28th, the European Anti-Fraud Office (OLAF) was created. Its purpose is to intensify activities to combat fraud, corruption and other illegal activities that adversely affect the Community's financial interests. OLAF's activity consists in investigating serious facts related to professional activities, which could constitute a violation of professional obligations. These violations are sanctioned with disciplinary measures and even criminal actions, when deemed appropriate.

OLAF's work is also regularly monitored by a supervisory committee, whose powers and composition are determined by the European Parliament.

The European Anti-fraud Office (OLAF) carries out administrative investigations in Member States on actions concerning the EU's financial interests and investigations targeting the staff of the European institutions.

2 Financing from European Funds

The EU provides funding for a range of projects and programmes. It applies strict rules, for tight control over how funds are used and to ensure money is spent in a transparent, accountable manner. EU funding comes in many different forms: grants, loans, guarantees and equity, prizes for winners of Horizon Europe contests.

Romania is responsible for the management and control of operational programs financed by EU, establishing eligibility rules for expenses financed from structural instruments, in accordance with Council Regulation no. 1083/2006. Romania became the first country in Europe to establish a structure with competences exclusively in the field of protection of the financial interests of the EU, the Department for the fight anti-fraud. Considering

the complexity of the financing system from European funds, the network institution from Romania involved in the verification of the expenditure of these funds, respectively the identification and the sanctioning of irregularities and fraud includes: the Anti-Fraud Department, the management authorities for ongoing programs, the paying authorities, the National Directorate Anticorruption (DNA) and intermediate organisms.

2.1 The risks involved in financing from European funds

European funds are one of the most sought-after sources of funding in the European Union, all the more so as funding programs are increasingly diverse and more and more areas are funded. In recent years, OLAF investigations have become more and more complex, which means that OLAF is faced with transnational cases, across several Member States and even beyond them. For example, one of these cases was analyzed by OLAF in 2018. It was a transnational case developed in two EU member states, Romania and Italy, consisting of buying and reselling the same products between companies from the two states, through an intermediary, without being paid VAT. (See fig. no 1)

Figure 1. Carousel fraud to evade paying VAT



Source: https://anti-fraud.ec.europa.eu/system/files/2021-09/olaf_report_2018_en.pdf

According to an OLAF report, in 2020, Romania had 8 out of the 109 cases of fraud with European funds (the same number of cases as Bulgaria and Hungary), after 2015 – 2017 and 2019, when our country had the highest number of fraud files analyzed annually by OLAF.

Table 1 – Analysis of OLAF’s activity in 2015 - 2021 (files analysed)

YEAR	FILES ANALYZED BY OLAF		
	TOTAL	TOTAL FILES OF ROMÂNIA	FILES CONCLUDED WITH RECOMMENDATIONS
2021	115	5	4
2020	109	8	4
2019	100	11 (THE MOST)	9
2018	84	4	2
2017	102	11(THE MOST)	8
2016	141	21 (THE MOST)	11

2015	199	45 (THE MOST)	22
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Source: OLAF activity Report, 2015 – 2021

Table 2 - Investigations into the use of EU funds managed or spent in whole or in part at national or regional level concluded in 2020 (OLAF)

Country	Cases concluded	
	Total number per country	of which closed with recommendations
Italy	13	9
Bulgaria	8	7
Hungary	8	4
Poland	7	2
Romania	8	4
France	7	3
Serbia	6	3
Slovakia	6	5
Spain	4	2
Syria	4	2
Uganda	4	3
Croatia	3	3
Greece	3	3
United Kingdom	3	2
Ethiopia	2	1
Mauritania	2	2
Armenia, Bangladesh, Bosnia & Herzegovina, Burkina Faso, Czechia, Denmark, Egypt, El Salvador, Estonia, Iraq, Moldova, Nigeria, North Macedonia, Portugal, Somalia, South Africa, Sweden, Turkey, Tanzania, West Africa*, Yemen	21 (1 per country)	13
Total	109	68

* Single investigation covered several West African countries (Côte d'Ivoire, Guinea, Liberia, Mali, Nigeria, Senegal, Sierra Leone)

Source: OLAF activity Report, 2020

Many countries face challenges in managing fraud and corruption risks related to European funds. Although the European Commission has issued guidelines (e.g. on fraud risk assessments), the documents are general and not country-specific. As a result, Romania has set out to develop its own specific strategy for managing fraud and corruption risks related to European funds. It was developed in a new form for the period 2021-2025. The vision of this strategy is to strengthen the national system for preventing and combating corruption by strengthening mechanisms for identifying and managing risks, threats and vulnerabilities related to this phenomenon, in order to guarantee professionalism and efficiency in the public sector, the safety of citizens and support a developed social and economic environment.

The Council of the EU adopted on 17 December 2020 the regulation on the new Multiannual Financial Framework (MFF) 2021-2027 and the Next Generation EU Economic Recovery Package (NGEU), which provides for a long-term budget of EUR 1 074.3 billion (in 2018 prices) for the 27 Member States of the European Union, including the integration of the European Development Fund. Together with the 750 billion EUR of Next Generation package, it will allow the EU to provide unprecedented 1.8 billion EUR in funding in the coming years to support the recovery from the COVID-19 pandemic and the EU's long-term priorities in different policies/areas (EU Budget of the Future).

The need for a detailed analysis of fraud risk and the development of fraud prevention and detection measures has become increasingly greater, especially after the launch of the National Recovery and resilience Plan (NRRP).

Romania's National Recovery and resilience Plan is part of the RRF (Recovery and Resilience Facility), being designed to support Romania's development by implementing programs and projects funded by European

Funds made available by the European Union through the NextGenerationEU program. Romania's National Recovery and resilience Plan is structured on 15 components, covering all 6 pillars provided by the Regulation: 1. The green transition; 2. Digital transformation; 3. Smart, sustainable and inclusive growth; 4. Social and territorial cohesion; 5. Health, as well as economic, social and institutional resilience; 6. Policies for the next generation.

Programs financed from the European Union budget can be classified, depending on the type of management, in: 1. Direct management programs (EU funds are managed directly by the European Commission); 2. Programs under shared management (EU funds are jointly managed by the European Commission and national authorities); 3. Indirect management programs (the funds are managed by EU or non-EU authorities or even partner organizations in those programs). Of these EU funding programs, shared management funds account for around 70%.

The 5 EU funds under shared management are:

1. European Regional Development Fund (ERDF)
2. European Social Fund (ESF)
3. Cohesion Fund (CF)
4. European Agricultural Fund for Rural Development
5. European Maritime and Fisheries Fund

2.2 Fraud against the financial interests of the European Union

An **irregularity** is an act that does not comply with EU rules, and which may affect the financial interests of the EU, but which may arise as a result of errors, committed unintentionally, both by beneficiaries who have requested funds and by the authorities responsible for making payments.

When irregularities are committed with the obvious intention of benefiting from undue benefits, they are cases of fraud.

Fraud is an "act of cheating committed to obtain personal gain or to cause a loss to a third party." (EU Directive 2017/1371).

In Romania, the main institution with responsibilities in the field of protection of the financial interests of the European union is the Department for Combating fraud. This is the institution that initiated and implemented the National Anti-fraud Strategy (SNLA).

The elaboration of the National Anti-fraud Strategy for the Protection of the European Union's financial interests in Romania had as a starting point the need to streamline the financial control and fiscal control that is exercised in relation to European funds. The strategy strictly concerns fraud against the EU's financial interests, with a delimitation between this type of fraud and corruption.

Fraud is defined as "any intentional act or omission in relation to:

- use or presentation of false, incorrect or incomplete statements or documents, which have the effect of allocating / acquiring, respectively inappropriate or incorrect use of Community funds from the general budget of the European Community and / or the corresponding co-financing amounts from the state budget;

- failure to communicate information in breach of a specific obligation;

- "diverting funds from the purposes for which they were originally granted." (O.G. 79/2003 (updated in 23 august 2008).

Although fraud is a broad legal concept, the external public auditor is interested in fraud that produces significant distortions. There are two types of intentional distortions that are relevant to the external public auditor:

- distortions resulting from the misappropriation of assets and
- distortions resulting from fraudulent financial reporting.

O.G. 79/2003 (updated) defines, in addition to fraud, the irregularity as "any deviation from legality, regularity and compliance, as well as any non-compliance with the provisions of the financing memoranda, memoranda of understanding, financing agreements – supporting the non-reimbursable financial assistance granted to Romania by the European Community –, as well as the provisions of the contracts concluded under these memoranda/agreements, resulting from an action or omission by the economic operator, which, through a

non-eligible expense, has the effect of prejudicing the general budget of the European Community and/or local budgets.”

For example, the fact that a bidder, even if it has no intention to do so, can influence the conditions of a tender in a way that is favorable to it, constitutes a situation of conflict of interest. When a conflict of interest is detected, Member State authorities should take into account possible implications for other operations or contracts for the operation(s) concerned and act accordingly to prevent new situations of conflict of interest.

So, the thing that distinguishes fraud from irregularity is **the intention**, the good will with which the deed is done.

2.3 Specific elements for shared management

The overall responsibility for the implementation of the EU budget rest with the Commission. However, around 75% of the EU budget is implemented by Member States under shared management, in accordance with the rules of FR 2018, applicable EU sectoral law and national rules. Close cooperation between the Commission and national authorities is therefore necessary to ensure that the EU budget is used in accordance with the principles of sound financial management and that the EU's financial interests are protected by an appropriate accountability model.

Shared management means that Member States (and their regions, too), taking into account their institutional and legal framework, are responsible for the implementation of programs and actions funded under shared management. This role also includes defining the scope of support from the Funds and developing specific tools for support and the allocation of funds to beneficiaries (e.g. businesses, farmers, municipalities, etc.), as well as audits and controls on the implementation of the programs. Under shared management, the Commission is responsible for proposing EU legislation, adopting programs, performing certain advisory functions and supervising the implementation of programs, including monitoring and auditing, without intervening directly at operational level.

For the assessment of the main fraud models related to EU funds under shared management, the distinction must be made between: detected irregularities and fraudulent irregularities (as fraud cases are difficult to be detected).

2.3.1 Risks to fraud of European funds

The main risks of fraud are:

- the falsification of documentation – this may consist of:
 - the falsification of documents, which give the impression that the applicants fulfill the conditions necessary for obtaining the funds;
 - the artificially split of the project and submit multiple applications for funding.
- the breach of contract terms:
 - the falsification of documents by which the non-compliance with the contractual conditions can be masked;
 - the reception and the payment of non-executed works, through false supporting documents (attesting compliance with contractual clauses);
- fraud related to the fulfillment of eligibility criteria:
 - falsification of the documents necessary to obtain an additional score in the selection of the funded projects;
 - submission of false statements regarding the fulfillment of the eligibility conditions;
- fraud related to breach of public procurement rules:
 - simulating by the beneficiary the procedures for awarding contracts for works or equipment;
 - subcontracting the works to another company after winning the contract;
 - overloading the financier through requests for reimbursement of costs for goods or services purchased at lower prices;
 - “plagiarism” means that a project which receiving funding has been copied;
 - “double funding” – which involves financing a project from several sources, without the financiers knowing that there are other sources of funding.
- fraudulent financial reporting
 - manipulation, falsification (including the production of false documents) or modification of the accounting records or supporting documentation on the basis of which the financial statements are prepared;

- intentionally misrepresenting or omitting from the financial statements of the operations, transactions or other important information;
- international misapplication of accounting principles in terms of values, classification, presentation or description. Fraudulent financial reporting often involves to avert the controls by the management, that, in fact, seem to work effectively.

As regards internal fraud committed by EU staff and staff of the EU institutions, 60% of the sections mentioned undeclared conflicts of interest, 57% confidential information leaks and fraudulent payment claims of 21%. Indeed, illegal or false subcontracting, the use of offshore bank accounts and corruption are the types of public procurement fraud that are often the subject of OLAF investigations (Official Journal of the European Union, 2021/C 121/01).

2.4 Combating fraud against the EU budget

The Financial Regulation requires EU Member State authorities to put in place effective internal control systems to prevent or detect and correct fraud and irregularities, but it does not require them to maintain a blacklist and apply exclusion situations and procedures similar to those used for EDES, which only cover expenditure under direct or indirect management. The Financial Regulation and sectoral legislation (Article 144 of the Financial Regulation, Article 5 of Commission Delegated Regulation (EU) 2015/1971 and Article 5 of Commission Delegated Regulation (EU) 2015/1970), also provide for Member States to use the IMS (irregularity Management System) to report fraud and irregularities related to EU funds under shared management (Article 122(2) of Regulation (EU) No 1303/2013, Article 50(1) of Regulation (EU) No 1306/2013, Article 30(2) of Regulation (EU) No 223/2014, Article 5(5) of Regulation (EU) No 514/2014, Article 21(1)(d) of Regulation (EU) No 1309/2013). However, the Commission should consult the Member States before using the reported data in this way (Article 144 of the Financial Regulation) and may use those data only to exclude counterparties from receiving funds under direct or indirect management.

The EU public Procurement Directive (Article 57) requires Member State authorities to exclude counterparties in certain situations. The requirement applies to all public procurement in the Member States, including those involving EU funds. The Directive lists the mandatory and optional exclusion situations that Member States must transpose into national law. Optional exclusion situations include those that are mandatory under the EDES (bankruptcy, insolvency and other similar situations), but in practice, Member State authorities may exercise considerable discretion as regards exclusion situations that apply in certain public procurement procedures. Thus, there is a different classification from one country to another of the criteria for excluding counterparties from financing and thus the protection of EU financial interests under shared management is less than under direct management.

3 Conclusion

The protection of the EU's financial interests in Romania is carried out through the DLAF (Anti-fraud Department). It is the contact institution for OLAF in Romania and ensures, supports and coordinates the fulfillment of Romania's obligations regarding the protection of the EU's financial interests, in accordance with the provisions of Article 325 TFEU.

From 1st of January 2016, in order to protect the EU's financial interests more effectively and to ensure fairer financial management, the European Commission has established the EDES – the early detection and exclusion system, which has brought a number of improvements in:

- Early detection of persons or entities which present risks to the financial interests of the Union
- Exclusion of persons or entities from participation in award procedures or selection for the implementation of Union funds, where they fall under the following circumstances: bankruptcy or insolvency, non-payment of taxes or social security contributions, serious professional misconduct, involvement in criminal activities (fraud and corruption or participation in a criminal organization), serious breach of a contract, entities created with the intention of circumventing tax, social or other obligations (Creation of letter box companies, in accordance with Article 136(1) of the Financial Regulation;
- Imposing a financial penalty on a person or entity (Article 138 of the Financial Regulation);
- Information on early detection, exclusion or financial penalty may come from:
- final judicial decisions or final administrative decisions;

- concrete data and findings of the Commission's Anti-fraud Office (OLAF), the European public Prosecutor's Office (EPPO), the Court of Auditors, audits or any other checks or controls carried out under the responsibility of the authorizing officer responsible;
- non-final decisions or administrative decisions that are not final;
- decisions of the European Central Bank (ECB), the European Investment Bank (EIB), the European Investment Fund or international organizations;
- cases of fraud and/or irregularities reported by national authorities managing the budget under shared management;
- cases of fraud and/or irregularities reported by the entities implementing the budget under indirect management.

In view of the situations created until the new financial protection system was established, we consider it is opportune to apply the main elements of the EDES to all types of European financing (including shared financing), so that there is no longer discrimination or exclusion of counterparties from financing, depending on national laws.

The practical work also notes the need for an extensive database on activities financed by European funds in the Member States of the European Union.

As so far, in the coming period, both the European institutions (OLAF, ECA, EPPO) and the national institutions need to continue and expand their actions to prevent and combat fraud and corruption, including frauds generated by shared management of European funds.

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BOOK REVIEW

Foundations Of Real-World Economics: What Every Economics Student Needs To Know

AUTHOR: JOHN KOMLOS
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Abstract: In 18 chapters with a rich bibliography, the economic historian John Komlos pleads for a more just capitalism (or capitalism with human face) and the new paradigm of humanistic economics. He demonstrates that conventional policies have shown their ineffectiveness, while theoretical models of perfect competition are misleading. The author underlines that differences between humanistic and mainstream economics are considerable and they are evident in various aspects, including markets and the government's role in the economy. With pointed arguments it is illustrated that economic policy is of crucial importance nowadays and its key goal should be people's well-being and not economic growth at all costs. It is all-important to minimize anxiety, inequality, insecurity, pain, poverty, stress, unemployment as well as to maximize ethics, intellectual satisfaction, health, leisure time, social relationships, love, respect, and a moral life. It is emphasized that markets have weaknesses that detract from their ability to increase the prosperity of the population at large. The "high-pressure" "winner-take-all" economy is criticized and the emphasis is put instead on the quality-of-life indicators. The argumentation includes the 2008 financial crisis, the rise of Trumpism and the other populist movements. It is based on examples from the US economy, however the comparative analysis and general postulates are present throughout the entire work. This book is addressed not only to students who must understand the principles of economics, both at micro- and macroeconomic levels, but also to professors, researchers, practitioners of the private sector and policy-makers.

Key words: capitalism, humanistic economics, economic policy, markets, quality of life, well-being

JEL codes: E02, E10, E20, D10, D60, O10, O50, P10.

1. Introduction

The contemporary ideology of neoliberalism remains the backbone of mainstream economics, in spite of its failures. In three editions of the book "Foundations of Real-World Economics: What Every Economics Student Needs to Know", the renowned scholar, John Komlos, underscores that mainstream economists continue to assume that "markets are competitive and people are rational and can maximize their welfare" (Komlos, 2023a). Nevertheless, well-being is not uniformly distributed across society. Economic inequality in different aspects, such as the distribution of wealth, income, and privilege "has become a severe socio-economic, political, and cultural obstacle to a good life for a goodly share of the population" (Komlos, 2023b).

Especially the second and the third edition were intensely reviewed (Allen, 2019; Blackford, 2019; Cantillo, 2019; Foster, 2019; Ioan-Franc, 2019; Ash, 2020; Burnazoglu & Ostermeijer, 2020; Coclanis, 2020; Jahangir, 2020; Quinn, 2020; Tomer, 2020; Balak, 2021; Freeman, 2023; Hillebrand, 2023). Previous editions

have been translated into Romanian and Hungarian, as well as in other languages. Beside reviews in academic journals, there are also valuable comments on the book on popular online platforms (Jahangir, 2022).

Ash (2020) states that “the book provides a checklist of what is wrong with contemporary economics”. He points also to some weaknesses, for instance some explanations are too abridged for students in introductory courses, and some diagrams are difficult to follow for readers without a solid background. Tomer (2020) underscores also that this book is more appropriate for advanced students. Freeman (2023) discusses the three additional chapters of the 3rd edition and points to one of the most relevant strengths of the book, namely the remedies proposed under the concept of “humanistic economics”.

As an antithesis to the current economic model with “few winners and many losers”, the author argues for “a more *harmonious economy*, with a creative, decent, dignified, enjoyable, satisfactory, secure, sustainable, and peaceful life, one that is not based on excessive consumption, instant gratification, and cutthroat competition – one that is less materialistic” (p. 8). It is necessary “to rein in our appetite, our greed, and have a mind-set that is less concerned with success measured by money and status and be able to enjoy more of what we already possess” (p. 8). This alternative model, with the goal of well-being, is the new paradigm of *humanistic economics*. This review discusses its relevance to economic theory.

2. Humanistic economics

As Komlos emphasizes, humanistic economics should have behavioural economics as a theoretical foundation, replacing the utility-maximizing rational-agent models (p. 83).

The first chapter describes the essence of real-world economics and the new paradigm of humanistic economics. Contrary to mainstream economics, humanistic economics has as key goal the quality of life instead of consumption. Start of analysis is evidence (or facts, reality), not axioms and should begin with children, not with adults because children are part of economic life and their character is also formed by the market. Markets should be just, not completely free. Government’s role should be substantial, not minimal. Basic needs are not omitted, but considered paramount. Behavioural homo sapiens is the key actor, not the rational homo oeconomicus (p. 4). In the context of various failures of the economic system, “economic policy is of paramount importance” (p. 7).

In the second chapter, “The Evidence – Markets are Neither Omniscient Nor Omnipotent”, humanistic economics opposes “high-pressure economy”. In the process of income generation its effects on the quality of life should not be ignored (p. 20). Hence the focus should be on a reasonable distribution of schooling, employment, income, and wealth (p. 21).

Markets are not omniscient, “they are man-made institutions with innumerable shortcomings” (p. 37). The most obvious limitations include: costly and asymmetric information, uncertainty, unequal power between counterparties, production concentrated in oligopolies or monopolies, significant transaction costs, negative externalities, manipulation of consumers, or unethical market outcomes (p. 30). Consequently, under the humanistic economics approach, laissez-faire “should not be the default model” (p. 30). Markets and governments complement each other (p. 33).

The direct goal of markets should be to improve the quality of life (p. 32). For too long the focus of economists and politicians has been GDP growth, however “*well-being is multifaceted and should be not equated with growth of GDP*” (p. 33). Referring to the United States, the author concludes that even in the country with the highest GDP in current prices, half of the population does not have an adequate quality of life and it is high time for changes.

The third chapter, “The Nature of Demand”, underscores that consumer sovereignty is a myth from multiple perspectives. First, income is not equally distributed, therefore there are wealthy and poor consumers, not all the consumers can buy the desired products. Second, tastes are endogenous (determined within the economic system), with the exception of basic needs (food, clothing, shelter, and health care). Advertising industry and social relations strongly influence the consumers’ taste and consumers are not in control of their tastes, values, and choices (pp. 45-46). Demand is strongly influenced by persuasion techniques used in advertising, and only a minority of consumers are aware of this. Humanistic economics advocates for freeing consumers from the power of advertising and influencers working for powerful corporations (p. 51). Komlos explains that consumerism and the greed accompanying it is not consumers’ choice, but it was imposed by the powerful business interests (pp. 54-55). High indebtedness is only one of the negative consequences of consumerism and lack of consumer sovereignty.

The fourth chapter, “Homo Oeconomicus Is Extinct – The Foundations of Behavioral Economics”, emphasizes that people are not always rational and they are not capable of maximizing their utility in a coherent

manner (p. 67). On the one hand, customers have cognitive limitations (due to lack of complete information, constraints of time, finances etc.). On the other hand, mega-corporations devote considerable money to take advantage of those limitations (p. 69). Nobel Prize Laureate Herbert A. Simon demonstrated already in the 1950s that it is more probable that people rather aim for a satisfactory solution to their problem than the best possible one. Therefore satisficing is much more realistic than the utility-maximizing model (pp. 69-70). People often make wrong decisions, based on the fact that there are three biases of the human mind: framing, accessibility, and anchoring. First, our choices depend on the way the options are presented (or framed). Second, some pieces of information and attributes are more accessible than others. Third, people focus and rely in some information more than appropriate (anchoring), which may lead to bad decision-making (pp. 72-74). “*Intuition overrides the rules of logic*” for homo sapiens, in contrast to homo oeconomicus.

Based on the previous two sections, the fifth chapter, “Taste-Makers and Consumption”, and the sixth “Oligopolies and Imperfect Competition” focus on the ethical nature of production, consumption, and income distribution. Taking into account the tremendous corporate influence, values, norms, morality should not be delegated to markets. The main objective of humanistic economics is the creation of a just economy. On the basis of various practical examples, the author demonstrates that taking advantage of market power is a rule, not an exception.

Chapter seven, “Returns to the Factors of Production” starts with a theoretical framework of payments to the factors of production, labour compensation, marginal utility, marginal cost, marginal revenue, and marginal product of labour. Taking again as a case study the US, the author emphasizes that labour compensation lags far behind productivity (pp. 125-131). He underscores that employees are not compensated adequately for their contribution to profits (p. 134), share of labour income in GDP declined considerably as compared to the 1950s (p. 135), and welfare does not grow at the same rate as the economy (p. 147).

The issues presented in the first chapters are explored further in the following sections. Practical examples and case studies are accompanied by theoretical explanations and models characterized by imperfect competition. A variety of useful conclusions are presented after the elaborated argumentation, including that of the utility of trade unions and minimum wages, which can redress the imbalance of power between mega-corporations and their employees. Instead of generating more unemployment in the real world, the minimum wage and unions can increase the living standards and lead to a more equitable distribution of income (pp. 176, 189).

The section regarding the technological change seen as a double-edge sword is also worthy of attention. Innovation in financial technology, for instance, was rent seeking and posed dangerous systemic risks, which were disregarded until the bankruptcy of Lehman Brothers (p. 218). The strategy of “planned” obsolescence of various products is profitable for mega-companies but does not bring substantial welfare improvements for consumers. The author reveals strategies of rent seeking disguised as innovations, but they do not improve living standards (pp. 219-220). Technological unemployment is seen as an “increasing threat”. The spread of automation, robots, and artificial intelligence at a rapid rate influences both employment and wages. Solutions presented include: reducing the hours worked, guaranteeing a basic income for all, and the government becoming an employer of last resort (p. 355).

Finally, it is worth mentioning that the issue of GDP as a misleading indicator of well-being is present in various chapters of this book. “*GDP should not be equated with welfare*” (p. 3). There are many arguments in this regard: it does not include the cost of pollution, expenditures to remove the damages of extreme weather events are indirectly taken into account, GDP does not take into account the unpaid work (for instance, responsibilities at home such as childcare, shopping, housecleaning cooking), it disregards the distribution of income, it is based on prices “that do not reflect fundamental values during bubbles” (pp. 223-225).

3. Concluding remarks

The book in all its three editions makes a valuable contribution to the current literature. The author employs a heterodox approach, questioning the neoclassical conceptualisation in current textbooks. Empirical facts are considered as the most useful way to make students understand the working of the real economics. Each chapter ends with a “Questions for discussion” section, an invitation to further debates.

The main takeaway from this complex investigation can be synthesized as follows. The old textbooks are abstract representations of the real world, therefore students “fail to grasp essential aspects of *real-existing* markets in the hyper-globalized world of the twenty-first century”. Instead, it is necessary to understand that markets do not lead automatically to well-being. Consumers are often manipulated. The perfect competition

model is irrelevant, as most industries are dominated by a handful of large firms. The economic system is not always in equilibrium (supply is only rarely equal to demand), we often witness crises and bubbles. Based on a host of arguments, the author explains why neoliberalism is anachronistic, i.e. inadequate to meet the challenges of the “crisis-ridden world” of the 21st century (pp. 5-7).

Homo sapiens and not homo oeconomicus is at the centre of humanistic economics. Intuition, emotion, status seeking, all these influence human action (p. 3, p. 64). Komlos underscores that behavioural economists such as Daniel Kahneman, Amos Tversky, and Richard Thaler demonstrated decades ago that intuition is more often the engine of the decision making process than reasoning (p. 71). Rational choice is an inappropriate assumption “since genetic endowment is so influential” and there is no guarantee that human behaviour is guided by rationality (p. 58, p. 169). The human mind has extensive limitations, preventing consumers from attaining the optimal choice (pp. 69-70). Besides, some groups in society are easier to manipulate than others and “in this way, the rationality assumption provides succour for the maintenance of the status quo socio-economic order” (p. 325). Markets have to be effectively regulated with sufficient oversight, economic policy is a necessity and at the centre of all initiatives should be real people and their well-being.

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