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DOMINANTS FOR THE NATIONAL ECONOMIES' COMPETITIVENESS

ABSTRACT

This article is devoted to innovation as a prerequisite for the national economies' sustainable development and a domain for their global competitiveness. The paper aims to highlight the internal essence of mutual relations between innovation, competition, and economic growth. It was assumed that innovation positively affected the competitive behaviour of economic agents and eventually contributed to an increase in public welfare. Regarding the period from 2007 to 2022, we considered the sample of Central European countries and the Baltic states. Theoretical generalization has been applied to systematize the factors determining competition and innovation. We used statistical methods and comparative analysis to investigate the indicators' dynamics. The interdependencies between macroeconomic dynamics and a set of competition and innovation indicators have been assessed. It was proved that the proportion of medium and high-tech industry value added in the total value added of manufacturing was quite important, yet not the ultimate criterion for ensuring high growth rates and sustainable development. The dynamics of commercial spending on research and development had been ambiguous and unsustainable. To ensure strategic competitiveness, national governments should encourage innovation in their respective business communities. The sampled economies have been examined considering a set of innovation and competition indicators (e.g., gross capital formation, research and development expenditures, logistics performance, export technological structure, carbon dioxide emission, and renewable energy consumption). Considering the implications of globalization, the tax burden as an integral characteristic of the national economy's competitiveness has been evaluated as well. It was pointed out that: a) a stable, understandable and transparent tax policy should be implemented to protect the investors' property rights; b) a system of total anti-corruption measures aimed at preventing the practices of receiving undue benefits should be set; and c) the business sector should improve own environmental and social responsibility complexly, introduce resource-saving, a green and circular economy.

Keywords: competition, economic growth, high-tech economy, innovation, investment, sustainable development, taxes, research and development expenditures

JEL Classification: O47, O52, P47, P51

INTRODUCTION

As economic phenomena, both competition and innovation determine and shape the business entities' modus operandi. Theoretically, in the long run, market competition could be and should be capable of maximizing the respective economic agents' benefits. Meanwhile, the aforementioned agents' anti-competitive intentions and unfair practices prompt respective institutional counteractions. In the most radical cases, competition forces authorities to impose anti-monopoly policies (aimed to ensure general fairness and optimal economic performance as well). Thus, the competition's ontological aspects form an essential object for investigation. Moreover, its initial idea derives from the architectonics of public production and innovation par excellence. Innovation is commonly considered a trigger for both market competition and sustainable development. However, the exact model of strategic interconnection between competition and innovation depends on the national economy's institutional peculiarities and is determined historically.

From a strategic perspective, taking the concept of Industry 4.0 and the modern technological paradigm into account, innovation could determine both the national economy's and the economic subject's competitive position, while effective innovation management should ensure sustainable growth. At the same time, neither competition nor innovation should be regarded as an ultimate panacea for economic recovery and prosperity. Even though fair competition combined with innovation might hypothetically reactivate the national economy's development processes, the latter could not occur automatically. Hence, the national government, in coordination and cooperation with the business community, should prepare and implement a general innovation doctrine (based on prudent fiscal policy). The business community inherently possesses innovation potential, while a novation could be identified as a channel for development. Considering the above, innovation management forms the core task for a business in terms of global competition.

Due to the indisputable relevance of the aforementioned scientific issue, it is vital to systematize and deepen the methodological bases of fair competition, considering both advanced and emerging markets' innovation experience. Specific attention should be paid to the innovation's effect on the global competitive doctrine. This study aims to assess the interdependencies between economic growth, competition and innovation, and to conceptualize the complex measures for innovative development stimulation.

LITERATURE REVIEW

For nearly a century, the coherency between competition and innovation has been an issue of great interest for the most prominent scholars and has provoked a plethora of theoretical and empirical studies. Upon the analyses of business cycles and creativity, Schumpeter (1935; 1939; 1947) pointed out that innovation and the certain market situation (in terms of competition) had been the triggers and the main factors for sustainable economic growth. The scholar proved that competitive advantages originated in innovation and determined the latter as the paramount dimension of economic change. Utterback (1971) highlighted the effectiveness of business entities in preparing, developing, and implementing technical innovations as a function of three sets of factors: a) the firm's exogenous environment peculiarities; b) inherent characteristics of the firm; and c) the 'flows' between the firm and its environment. The scholar disclosed both stimulating and limiting the firm's progress factors.

Considering the concept of transience, Abernathy & Clark (1985) developed an analytical framework for the competitive implications of innovation. They argued the role of incremental technical change in shaping competition. Porter (1985; 1986; 1996) investigated competitive advantages, technology, agglomeration economies, and regional and international policy and proposed a new narrative economic development model. Tushman & Nadler (1986, 1999) proved that companies should create new products, services, and processes, adopting innovation as a way of corporate life. Jorde & Teece (1989; 1990; 1991) described the nature of the innovation process and explored socially beneficial forms of cooperation that could assist the development and commercialization of the new technology. Lengnick-Hall (1992) examined the factors that shaped the relationship between innovation and competitive advantage, proving that innovative intentions have been the basic business requirement. Tang (2006) investigated the complex relationship between innovation and competition and pointed out that it could be either positive or negative, depending on specific competition perception and the type of innovation activity. In a series of studies (Pol & Carroll, 2004; Pol, 2013, 2020), the Schumpeterian innovation theory, as well as the Porter model of development and competition, has been reconciled by an introduction of the 'innovatory discontinuity' concept and separation between formal and narrative economic models.

Based on the extant theoretical and empirical research, Lee & Karpova (2011, 2018) investigated the definitions of competitiveness to develop a comprehensive perspective of the construct under study. Considering specialization and cooperation in agribusiness, Krasnyak (2017) proposed some statements on synergy in the business environment aimed at intensifying fair competition. Highlighting the Visegrad 4 countries' experience in the context of Industry 4.0, Ivanová & Čepel (2018) assumed that the innovation performance of the enterprises has been the national economies' key factor in increasing competitiveness. Ungerman et al. (2018) investigated the areas of marketing in the context of Industry 4.0 and their subsequent impacts. The scholars highlighted innovation as the main factor in competitiveness. Applying factor analysis, García-Sánchez et al. (2018, 2021) examined the relationship between innovation, competition and prosperity and found it statistically robust. Stadnyk et al. (2018) highlighted the factors of the enterprises' strategic participation in the selection process of integration forms. The authors substantiated that the national economy's competitiveness was ensured by mutually beneficial cooperation of different business activities and the firms' industrial specialization. To encourage both innovation and competition, an algorithm for the enterprises' strategic decision-making towards its prospective participation in integration has been proposed. Taking the industrialization degree into account, Marincean (2019) pointed out that innovation provisions should be formulated according to the competition rules. The scholar argued that public regulation of innovative processes could contribute to economic development.

In a series of publications (Pasichnyi et al., 2019; Kozlovskiy et al., 2020; Pasichnyi & Nepytyaliuk, 2021; Kaneva et al., 2022; Khachatryan et al., 2023), gross investment in innovation regarding both fundamental and applied sciences was considered as a factor ensuring economic growth. Studying knowledge management, Bloodgood (2019, 2022) highlighted the competitiveness effects of acquiring pertinent, irrelevant or erroneous knowledge. Paiva et al. (2020) pointed out how research and development (hereinafter – R&D) collaboration and access to capital and specialized human resources could improve agrarian companies' competitiveness. Padilla-Lozano & Collazzo (2021) investigated the multi-level relationship between competitiveness, green innovation, and social corporate responsibility and causality in manufacturing. The scholars proved that green innovation suggested a transition from cost savings to a strategic competitive advantage.

Considering the sample of Eastern European countries, Ivanova et al. (2021) investigated the conflict of environmental and economic interests of the state, highlighted contemporary trends in entrepreneurship (e.g., implementation of energy efficiency policies, decarbonization, decentralization, and digitalization), and analyzed the national policy of the EU member-states from the standpoint of environmental friendliness. In addition, the authors argued that the above trends formed the core of ongoing business transformations. Khachatryan et al. (2022) examined the specific features of investment in human capital in terms of a postmodern society. The scholars pointed out that the interrelation between human capital formation and the business entities' overall economic performance appeared to be robust and positive. Moreover, quality improvements in human capital contributed to innovation and competition.

Investigating the scientific works on the relationship between sustainability innovations and firm competitiveness, Hermundsdottir & Aspelund (2021, 2022) proposed the revisionist view that sustainability innovations could create win-win situations for a firm. The authors examined several moderating and mediating factors influencing the highlighted relationship in national, market, industry, and firm contexts. Soloviova et al. (2023) analyzed the strategic development directions of international corporate social responsibility in agribusiness as its inherent competition-enhancing factor. The above directions were defined as: a) motivation of labour personnel; b) introduction of waste-free production and environmental protection; c) maintenance of transparent relationships with the clients; d) brand distribution; and e) reduction in the levels of poverty and inequality.

Meanwhile, the internal essence of the mutual relationship between innovation, competition, and economic growth remains undisclosed. This study aims to highlight the above interrelation.

AIMS AND OBJECTIVES

This article aims to assess the interdependencies between economic growth, competition, and innovation and to conceptualize the complex measures for stimulating innovative development.

The main objectives of the study are:

- to systematize and deepen the methodological bases of fair competition, considering both advanced and emerging markets innovation experience;
- to disclose the innovation's effect on the global competitive doctrine, specifically regarding the concepts of resource-saving, green and circular economy;
- to investigate the mutual relations between selected competitiveness indicators and economic growth;
- to examine the tax burden as an integral characteristic of the national economy's competitiveness in Central Europe and the Baltic states over 2007–2022.

METHODS

In this article, we focused on a sample of national economies that made their transition from centralized planning to the market in the 1990s, and later either joined or declared their intentions to join the European Union (hereinafter – the EU). Considering their innovation and competition profiles, the national economies of Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Moldova, Poland, Romania, Slovakia, Slovenia, and Ukraine were investigated. We considered the time interval from 2007 (the beginning of the Great Recession) to 2022 (the first year of Russia's full-scale military invasion of Ukraine). The statistics and forecasts of the World Bank and the International Monetary Fund formed the information base of this particular study.

We used theoretical generalization to systematize the factors determining competition and innovation. We applied statistical methods (e.g., grouping, study of dynamic series, etc.) and comparative analysis to investigate the dynamics peculiarities of the indicators. Our initial hypothesis was that innovation had a positive effect on the economic agents' competitive behaviour and in the strategic perspective contributed to an increase in public welfare.

According to the Wicksell / Cobb–Douglas productive function, labour (as a proxy to human capital) and physical capital are imperfect substitutes. That fact could be roughly described by the system (1):

$$\begin{cases} Y = A \times L^\beta \times K^\alpha \\ 0 < \alpha < 1 \\ 0 < \beta < 1 \\ \alpha + \beta = 1 \end{cases} \quad (1)$$

where Y – annual total production; L – annual labour input; K – annual capital input; A – total factor productivity; α and β – the output elasticities of capital and labour, respectively.

Due to the classical explanation, both α and β values are the constants and has been determined by the modern technological paradigm. Meanwhile, in social and economic systems, synergy matters essentially. Pasichnyi & Nepytyaliuk (2021) pointed out that not only positive, but also the other (negative and neutral) synergistic effect should be considered while preparing strategic public regulation measures. The above effect derives from the interconnections emerging between the basic public production elements. To determine total factor productivity, we applied a function of the above interconnection's arithmetic sum (*model 2*):

$$A = f(\sum_{i=1}^n EP_i) \quad (2)$$

where EP_i – emergent potential of the i -th interconnection between the basic public production elements.

Regarding the scientific investigations addressing the problem, the system elements interconnection's emergent potential (*model 3*) derives from respective innovation and competition potentials:

$$EP_i = f(IP_i, CP_i) \quad (3)$$

where IP_i and CP_i – innovation and competition potentials of the investigated macroeconomic system elements' interconnection, respectively.

In this study, we decomposed the system elements interconnection's emergent potential and refined the economic growth-friendly public policy mix.

RESULTS

At the initial phase of our investigation, we compared the real GDP per capita growth rates in the sampled countries and the structure of public production (Figure 1). Even though the strategic competitive advantages are associated traditionally with high-tech industry, we considered the proportion of medium and high-tech industry value added in the total value added of manufacturing jointly (due to the World Bank's methodology).

Regarding the real GDP per capita growth rates, the entire sample could be divided into three sub-samples. Firstly, the sub-sample of the countries with a low indicator ranged from -0.55% in Ukraine to 1.87% in Estonia (the group included the Czech Republic and Slovenia). Secondly, the sub-sample of the countries with a medium indicator ranged from 2.12% in Croatia to 2.73% in Slovakia (the group included Hungary and Latvia). Finally, the sub-sample of the countries with a high indicator ranged from 3.38% in Bulgaria to 3.91% in Poland (the group included Lithuania, Moldova, and Romania). The global financial instability and the COVID–19 pandemic affected the sample, provoking a decline that has been equaled to 7.63% and 3.67% of real GDP per capita in 2009 and 2020, respectively.

The case of Ukraine has been unique for the entire sample. In addition to the Great Recession and the COVID–19 global pandemic consequences, hybrid and eventually conventional war affected the Ukrainian economy in 2014 and 2022, respectively. Due to the Great Recession's impact, the aforementioned indicator's annual decline equaled to 14.76% of real GDP per capita. Meanwhile, due to the full-scale military invasion, the growth rates decreased by 17.13% of real GDP per capita. In the post-war period, theoretically, innovation and constant search for competitive advantages in cooperation

with the other sampled economies could ameliorate the Ukrainian economy's performance and contribute to a substantial increase in public welfare.

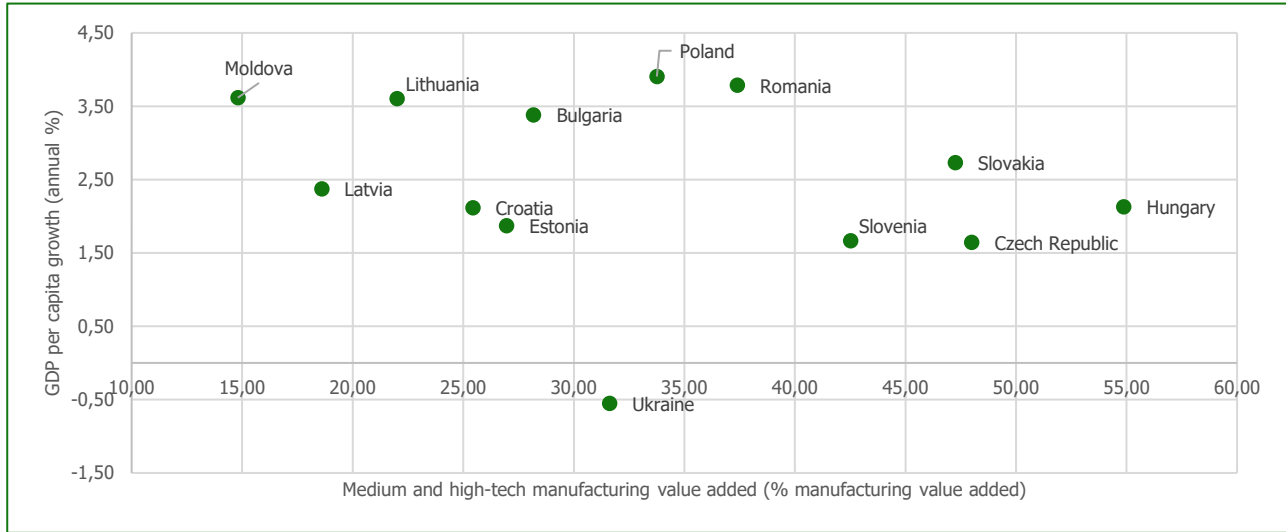


Figure 1. The average proportion of medium and high-tech industry value added in the total value added of manufacturing and the average economic growth rates in Central Europe and the Baltic states in 2007–2022. (Source: the authors' own calculation based on the World Bank and the International Monetary Fund data)

Regarding the entire period, Poland was the only sampled country with constantly growing economy. An insufficient decline (equaled to 1.85% of real GDP per capita in 2020) appeared to be episodic and derived from the COVID–19 global pandemic. Moreover, during the Great Recession, the Polish economy has been rising by 4.19% and 2.76% of real GDP per capita in 2008 and 2009, respectively. The observed phenomenon has been due to an effective policy mix (applied by the Government of Poland) and to innovation (provided by the business entities).

The stochastic interrelation between the above two indicators was rather ambiguous. The average proportion of medium and high-tech industry value added in the total value added of manufacturing varied significantly from 14.80% in Moldova to 54.87% in Hungary. Moreover, considering the entire time interval, the average economic growth rate in Moldova equaled to 3.62% and has been significantly higher than in Hungary (with the indicator equaled to 1.87%). Thus, the investigated proportion was quite important, yet not the ultimate criterion for ensuring high economic growth rates and sustainable development.

Regarding the global market, private investment in innovation was another factor ensuring the highlighted national economies competitiveness. We examined the share of firms that have spent on research and development in the overall business structure. Figure 2 represents the percentage of firms that, according to the World Bank, have spent on R&D in the 2013–2014 and 2019–2020 periods, respectively; the average level of innovative activity was marked as well.

The aforementioned indicator's fluctuations were ambiguous. The average proportion of the firms that have spent on R&D (given as a percentage of firms) in 2013–2014 equaled to 11.08%, while in 2019–2020 the mentioned indicator equaled to 9.25%. The observed reduction by 1.82 percentage points could be due to the methodology. We investigated the quantitative parameter – the percentage of innovation-active firms in the respective national economies. The obtained results could be improved by examination of the costs' (associated with innovative spending) proportion in the total costs.

In 2013–2014, the above indicators' range equaled to 16.80 percentage points (from 5.30% in Ukraine to 22.10% in Croatia). Moreover, in 2019–2020, the indicators' range equaled to 18.30 percentage points (from 2.30% in Lithuania to 20.60% in Slovenia). In 2013–2014, Romania (11.30%), Estonia (12.30%), Slovenia (17.40%), the Czech Republic (21.30%), and Croatia (22.10%) appeared to be the most innovative economies. In 2019–2020, the situation changed significantly; the most innovative economies were Ukraine (9.90%), Moldova (10.40%), Latvia (11.40%), Estonia (14.50%), the Czech Republic (20.40%), and Slovenia (20.60%). To boost competitiveness, national governments should encourage business innovation, applying the appropriate fiscal and investment policy mix.

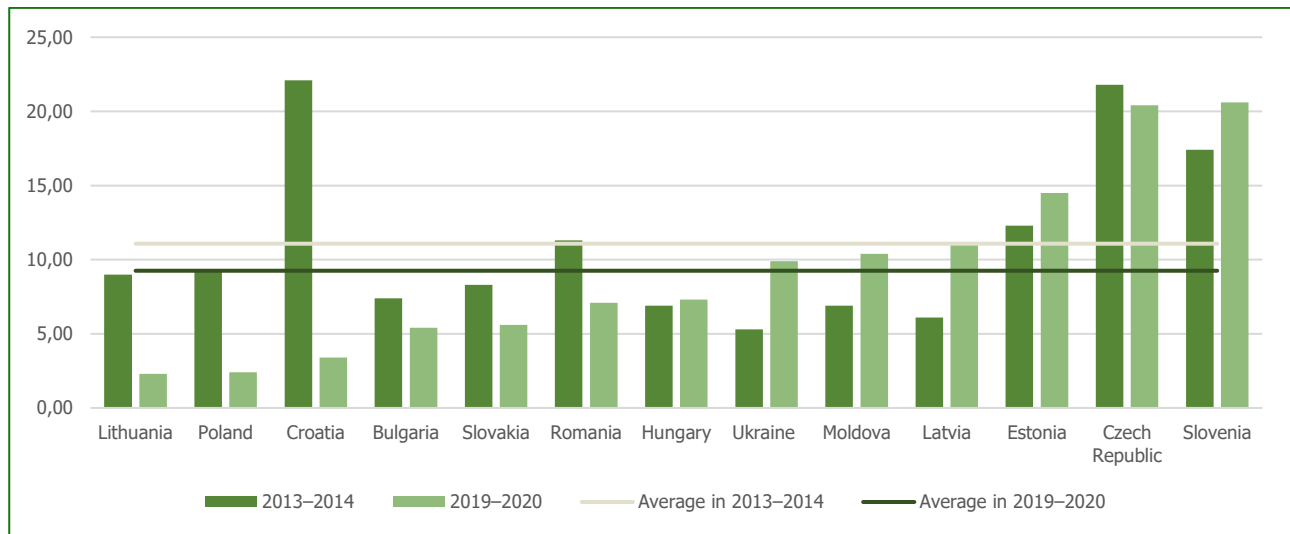


Figure 2. Firms that spend on R&D in Central Europe and the Baltic states in 2013–2014 and 2019–2020, a percentage of firms. (Source: the authors' own calculation based on the World Bank and the International Monetary Fund data)

At the next stage of the study, we considered a set of selected competition and innovation variables in Central Europe and the Baltic states over the 2007–2022 period (Table 1).

Table 1. Selected competition and innovation variables in Central Europe and the Baltic states in 2007–2022. Note: * - in 2022. (Source: the authors' own calculation based on the World Bank and the International Monetary Fund data)

Country Name	Gross capital formation (% GDP)	R&D expenditure (% of GDP)	Logistics performance index: Overall (1=low to 5=high) *	Share of (% manufactured exports)		CO ₂ emissions (metric tons per capita)	Renewable energy consumption (% of total final energy consumption)
				medium & high- technology exports	high-technology exports		
Bulgaria	23.22	0.70	3.20	40.46	8.99	5.82	16.65
Croatia	22.65	0.89	3.30	46.59	10.25	4.22	30.49
Czech Republic	27.94	1.73	3.30	69.19	18.42	9.81	13.73
Estonia	27.89	1.55	3.60	48.84	18.72	10.99	27.55
Hungary	24.62	1.31	3.20	76.22	19.97	4.67	14.24
Latvia	25.44	0.60	3.50	39.39	14.80	3.75	39.23
Lithuania	20.64	0.94	3.40	41.37	11.67	4.01	27.86
Moldova	26.11	0.33	2.50	28.22	4.36	2.98	20.94
Poland	21.41	0.99	3.60	55.63	8.77	7.80	11.96
Romania	26.39	0.47	3.20	57.55	9.73	3.87	22.91
Slovakia	23.41	0.79	3.30	69.46	9.29	5.95	12.55
Slovenia	22.32	2.09	3.30	63.77	6.73	6.92	20.68
Ukraine	17.98	0.59	2.70	38.79	5.97	4.99	4.96
Mean	23.85	1.00	3.24	51.96	11.36	5.83	20.29

Gross capital formation (formerly known as gross domestic investment) is commonly used to evaluate investment activity. From 2007 to 2022, in the most countries under study, gross capital formation (given as a percentage of GDP) had negative dynamics and declined by more than 1.50 times. The most substantial decrease in the indicator has been observed in the Baltic states, Moldova, Slovenia, and Ukraine. On the contrary, in Hungary, it had increased slightly. The average value of the indicator varied from 17.98% of GDP in Ukraine to 27.94% of GDP in the Czech Republic. The sample mean equaled to 23.85% of GDP. Investment-friendly fiscal policy (primarily, its tax component) should contribute to the innovation.

R&D expenditures (given as a percentage of GDP) directly highlight the innovation processes' peculiarities. Over the 2007–2022 period, the average indicator varied significantly from 0.33% of GDP in Moldova to 2.09% of GDP in Slovenia. In

addition to the Slovenian case, the indicator exceeded 1.00% of GDP in Hungary (1.31% of GDP), Estonia (1.55% of GDP), and the Czech Republic (1.73% of GDP). In the vast majority of the sampled countries, R&D expenditures had positive dynamics. Meanwhile, Ukraine, Romania, and Moldova were characterized by the indicator's decrease.

Indisputably, market competition strongly depends on the logistics. The Logistics Performance Index (hereinafter – LPI) reflects perceptions of a national economy's logistics based on the customs clearance process' efficiency, trade- and transport-related infrastructure's quality, ease of arranging competitively priced shipments, quality of respective services, ability to track and trace consignments, and frequency with which shipments could reach the consignee within the scheduled time. The LPI ranges from 1 to 5, with a higher score representing better performance. In 2022, Moldova (with a score of 2.50) and Ukraine (with a score of 2.70) appeared to be the sample's outsiders, while Estonia and Poland (with a score of 3.60 in both cases) were the leaders. The sample's score geometric mean equaled to 3.24. Public authorities and business should act coherently and prudent to improve the situation complexly. The microeconomic agents' self-organization could refine business-to-business logistics. Meanwhile, national governments should consistently employ performance-based budgeting practices (aimed at ameliorating trade- and transport-related infrastructure) and refine forecasting and planning procedures as well.

The average share of medium and high-tech products in the export structure varied significantly from 28.22% of exports in Moldova to 76.22% of exports in Hungary. Meanwhile, regarding the entire period, in Moldova, the indicator increased by more than 3.00 times. The sample mean equaled to 51.96%. In Ukraine, the start of the Russian hybrid war in 2014 marked the beginning of the rapid indicator's decline. In the other sampled countries, the investigated indicator increased. The average high-tech export's component percentage ranged from 4.36% of exports in Moldova to 19.97% of exports in Hungary, while the sample mean equaled 11.36% of exports. Thus, Hungary, the Baltic states, the Czech Republic, and Croatia had the most innovative export structures. Meanwhile, the interconnection between the investigated indicator and economic growth appeared to be quite ambiguous.

Both technology and the national economies' typical product profile determined carbon dioxide emission, transitively affecting competition. The emission of greenhouse gases indirectly indicated the technologies and peculiarities of public production. The sample's average annual CO₂ emissions equaled to 5.83 metric tons per capita. The national economies of Moldova and Latvia demonstrated the lowest annual emissions of carbon dioxide – 2.98 and 3.75 metric tons per capita, respectively. All the other sampled national economies reduced their CO₂ emission. In 2007, Estonia and the Czech Republic demonstrated the worst indicators equaled to 14.74 and 12.08 tons, respectively. The above economies subsequently reduced the indicator crucially, improving their competitiveness. The common trend for the sample was associated with green and circular economy.

The average share of energy consumption from renewable sources in final consumption was another essential factor ensuring the strategic competitiveness of the national economies under study. The sample mean equaled to 20.29% of total final energy consumption. In Ukraine, the average indicator equaled to 4.96% and increased by more than 3.50 times for the entire period under study. In Latvia, the average share of energy consumption from renewable sources in final consumption has been unprecedentedly high and equaled to 39.23%. To enter the EU, Ukraine should improve its energy consumption structure due to the best European practices.

At the next stage of the study, we assessed the tax burden as an integral characteristic of the national economy's competitiveness, considering globalization's implications (Figure 3).

In this study, we regarded the tax burden as the general budget's tax revenues' specific weight in GDP. Considering the sample, the lowest tax burden (equaled to 2.69% of GDP) was identified in Croatia. Meanwhile, in Hungary, the average tax burden has been the highest and equalled 22.58% of GDP. The sample mean equaled to 17.23% of GDP. Additionally, the actual average tax burden has been lower than the sample mean in the Czech Republic (14.45% of GDP), Romania (16.29% of GDP), and Poland (16.93% of GDP). An increase in the tax burden could deteriorate the national economy's strategic global competitive position, forcing the microeconomic agents to change their fiscal jurisdiction. Considering the entire period, the above indicator decreased by more than 2.00 percentage points in Romania and Moldova. A slight decline in the tax burden has been recorded for Slovenia, the Czech Republic, Bulgaria and Croatia. On the contrary, the other sampled countries were characterized by an increase in the tax burden.

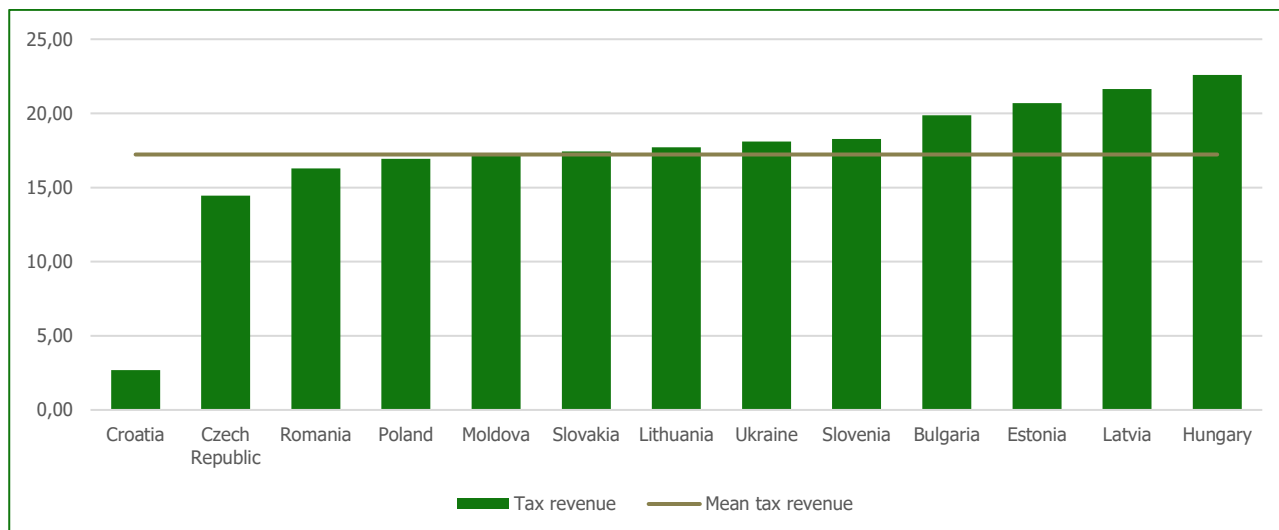


Figure 3. The average tax burden in Central Europe and the Baltic states in 2007–2022, a percentage of GDP. (Source: the authors' own calculation based on the World Bank and the International Monetary Fund data)

Theoretically, a decrease in the tax burden could be associated eventually with business reactivation and recultivation. Taking the above into account, economic liberalization should not be considered a panacea. GDP redistribution throughout public finances ensures economic sustainability, creating the most supportive conditions for the population. A prudent balance between the tax burden and the quality of public social services and their accessibility should be found to eliminate the negative effects of market competition.

DISCUSSION

The positive impact of innovation on the national economies' performance has been substantiated in a series of works from Schumpeter (1947) up to the present day. Yet, the scale of the above influence on the growth processes remains to be uncertain. Similar to the study of Rusu & Roman (2018), we investigated a sample of the Baltic states and Central European countries and found that the type of their economy had affected the overall result of innovation activities in terms of international competitiveness. While investigating the foreign trade's structure in terms of medium & high-tech export share, we obtained results partly similar to the study of Şener & Delican (2019). At the same time, we pointed out that foreign trade structure should be investigated taking advanced and emerging market economies' peculiarities into account. The national economies' typology proposed by Rostami et al. (2019) could be applied for that specific purpose.

Summarizing the sampled countries' competition and innovation experience, the measures aimed to eliminate bureaucratic procedures and to ensure maximum transparency of business registration, reorganization, and liquidation processes seem logical and actual. Moreover, to ensure economic sustainability both in the short and in the medium run, the non-critical public regulatory powers should be reduced essentially. National governments should promote registration and the existence of innovative businesses and directly support the firms implementing revolutionary ideas. A stable, understandable and transparent tax policy should ensure the protection of investors' property rights. The above should be carried out simultaneously with a system of total anti-corruption measures, aimed to prevent the practices of receiving undue benefits. Meanwhile, the business sector should take complex measures to improve both environmental and social responsibility, introducing resource-saving, a green and circular economy. Similar to the study of Jacomossi et al. (2021), we concluded that an indicator associated with ecological sustainability should be investigated properly while examining the countries' competitiveness.

Despite the results obtained by García-Sánchez et al. (2018, 2021), regarding the sample, the relationship between innovation, competition and prosperity has been rather ambiguous than statistically robust. Even though innovation contributed to economic development and global competition, its overall effect should be investigated properly. The idea of Hermundsdottir & Aspelund (2021, 2022) that sustainability innovations might create win-win situations for a firm could be considered regarding the national economy as well. In the last case, a growth-friendly fiscal policy mix should be applied to promote sustainable growth.

CONCLUSIONS

The Baltic states and Central European countries experienced similar problems in the 1990s and had objective incentives for economic transformations. Profound structural shifts affected production and redistributive processes and reshaped the national economies' consumption and investment profiles as well. Meanwhile, a strategic 'split' in public and private investment in physical and human intellectual capital has occurred. Due to the development logic, public welfare evolved substantially. That fact was marked by the transition from satisfying basic social needs to ensuring much more sophisticated individual requirements. A prudent cooperation of public authorities, civil society institutions and business entities could contribute to sustainable economic growth. In contrast to the rather selfish concept of *Homo oeconomicus*, the rational idea of mutually beneficial agents' cooperation should form the basis for the modern economic paradigm. Paternalism is organically incompatible with libertarianism since its social security model requires unattainable (for an ultra-liberal economy) public resources.

In terms of human intellectual capital formation, it is important to apply a new recognition approach to non-formal professional and vocational education. The business community should initiate, form and develop innovation and technology clusters, taking both the national economy's regional structure peculiarities and fiscal jurisdictions' profile into account. The other crucial task for the economies under study is associated with the investment and innovation ambassadors' concept implementation. Compiling the rules of fair competition, such economic agents could catalyze regional development processes and actively affect the labour market.

Businesses, institutions of higher education, and scientific centres should cooperate intensively to create a new growth-friendly economic paradigm. The aforementioned cooperation could include support of scientific and pedagogical personnel participation in international conferences and symposia, direct business financing of applied studies and co-financing of fundamental research. In addition, the practices of registration, promotion, protection, and support of intellectual property rights (e.g., patents, copyrights, trademarks, brands, etc.) should be enriched. Theoretically, the above policy mix could be able to ensure sustainable economic growth both in the medium term and in the strategic perspective.

To promote innovative business, prudent administrative deregulation and digitization should be exercised consistently and systematically. Hence, regarding the global market trends, the creation of stable, predictable and transparent tax legislation, improvement in public administration and protection of the economic agents' property rights form the core tasks aimed at boosting national economies' competitive positions. Thus, it is vital to refine a business culture based on both the Sustainable Development Goals and innovative approaches to socially responsible entrepreneurship.

Empirical evidence from advanced and emerging markets of Central Europe and the Baltic states over the period from 2007 to 2022 proved that innovation and competition were connected mutually and affected macroeconomic dynamics. Meanwhile, innovation has not been the ultimate factor ensuring sustainable economic growth: the sample's leaders in medium and high-tech industry proportion in the total value-added structure were characterized by rather moderate average real GDP per capita annual growth rates. The dynamics of private investment in innovation varied significantly regarding the period under study. Moreover, business communities of the sampled countries appeared to be more innovative in 2013–2014 than in 2019–2020. The observed fact could be due to the applied public policy as well as due to the methodological peculiarities. Generally, to boost the national economies' global competitiveness, the respective national governments should support business innovation, applying the appropriate fiscal and investment policy mix. The national economies under study were assessed in terms of competition and innovation variables (e.g., gross capital formation, R&D expenditures, the logistics performance index, the export's technological structure, environment pollution by CO₂, and renewable energy consumption). Gross capital formation and R&D expenditures appeared to be growth-friendly variables. The general trend in investigated economies was associated with a reduction in gaslight emissions and gradually induced renewable energy consumption. The sampled countries were estimated in terms of tax burden. Theoretically, a prudent reduction in the overall of the tax burden could generally improve the emerging markets' performance through the business entities' reactivation. On the contrary, a rapid increase in the tax burden could deteriorate the country's strategic global competitive position, forcing its residents to look for better fiscal jurisdictions. Governments should simplify innovative business registration and directly support firms implementing revolutionary ideas, resource-saving, a green and circular economy.

The prudent fiscal policy mix features (in terms of innovation and ecology) should be highlighted in further studies. The aforementioned scientific issue forms a perspective research field regarding the necessity to counteract deteriorations in the European economy caused by the full-scale war in Ukraine.

Over the period under investigation, the sampled national economies changed crucially and formed their unique profiles. Meanwhile, those economies gained some common features that should be regarded while improving scientific methodology. Thus, further investigation could involve the determination of the above systems' development peculiarities as the basis for their new typology.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

All authors have contributed equally.

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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

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ДОМІНАНТИ ЗАБЕЗПЕЧЕННЯ КОНКУРЕНТОСПРОМОЖНОСТІ НАЦІОНАЛЬНИХ ЕКОНОМІК

Статтю присвячено концепту інновацій у якості передумови стійкого розвитку національних економік і домінанти їх глобальної конкурентоспроможності. Метою статті є розкриття внутрішнього взаємозв'язку між інноваціями, конкуренцією та економічним зростанням. Зроблено припущення, що інновації позитивно впливають на конкурентну поведінку економічних агентів і сприяють зростанню суспільного добробуту. У часовому інтервалі з 2007 до 2022 року розглянуто вибірку з країн Центральної Європи та Балтії. Для систематизації факторів, що визначають конкуренцію та інноваційність, використано прийоми теоретичного узагальнення. Для дослідження динаміки системи індикаторів інновацій і конкуренції застосовано статистичні методи та компаративний аналіз. Оцінено множинні взаємозалежності між загальною макроекономічною динамікою й обраними індикаторами конкуренції та інновацій. Доведено, що частка доданої вартості середньо- та високотехнологічних галузей у загальній доданій вартості є важливим, але не ультимативним критерієм забезпечення високих темпів зростання та стійкого розвитку. Динаміка витрат суб'єктів господарювання на науково-дослідні та дослідно-конструкторські роботи виявилася неоднозначною та нестабільною. Національні уряди мають заохочувати інновації відповідних бізнес-спільнот, спрямовані на формування стратегічної конкурентоспроможності. Вибірку досліджено з урахуванням системи показників інновацій та конкуренції (зокрема валового накопичення капіталу, витрат на науково-дослідні та дослідно-конструкторські роботи, індексу ефективності логістики, частки середньо- та високотехнологічного експорту, викидів вуглекислого газу та споживання відновлюваної енергії). З огляду на глобалізацію оцінено податкове навантаження як невід'ємну характеристику конкурентоспроможності національних економік. Визначено, що: а) для захисту прав власності інвесторів має бути впроваджена стабільна, зрозуміла та прозора податкова компонента фіскальної політики; б) необхідно реалізувати систему тотальних антикорупційних заходів для запобігання практикам отримання неправомірної вигоди; в) бізнес-сектор має комплексно та систематично посилювати власну екологічну та соціальну відповідальність, запроваджувати ресурсозбереження, зелену та циркулярну економіку.

Ключові слова: конкуренція, економічне зростання, високотехнологічний сектор економіки, інновації, інвестиції, сталий розвиток, податки, витрати на науково-дослідні та дослідно-конструкторські роботи

JEL Класифікація: O47, O52, P47, P51