UDC 334.72:001.895(497.5)
Review Paper
https://doi.org/10.62598/JVA.12.1.5.27

Received: March 16, 2026
Accepted for publishing: June 16, 2026

ENTREPRENEURSHIP AND INNOVATION IN CROATIA: AN ANALYSIS OF GEM, GII, AND THE EU SCOREBOARD

Ivaniš, Marija, *PhD, https://orcid.org/0000-0002-0660-3924, University of Rijeka, Faculty of Tourism and Hospitality Management, Croatia, marijai@fthm.hr*

Zubović, Vedran, *asistent Ph.D., https://orcid.org/0000-0002-2289-280X, University of Rijeka, Faculty of Tourism and Hospitality Management, Croatia, vedranz@fthm.hr*

Mlađan, Ivan, *prvostupnik ekonomije, b.a., ivanmladan123@gmail.com*

Abstract: Purpose: *The study analyzes empirical indicators of entrepreneurial and innovation activity in Croatia based on a comparison of secondary data (GEM, GII, EIS), with the aim of identifying key structural barriers and providing a systematic overview of the state of the entrepreneurial and innovation environment, with implications for public policy.*

Design/methodology/approach: *The paper employs a quantitative approach based on secondary data analysis from three databases: GEM, GII and EIS for the period 2018–2023, using descriptive statistics, comparative analysis, time series analysis, and correlation analysis (including lag 1 correlation).*

Findings: *The analysis of the NECI index, GII and EIS indicates improvements in the quality of the entrepreneurial and innovation environment, but it remains significantly below the EU average. A restrictive entrepreneurial environment with pronounced structural and other problems still prevails. Key implications for public policy include: reform of the entrepreneurial institutional framework, systematic strengthening of R&D transfer, development of the innovation ecosystem, and strengthening entrepreneurial competencies through the education system.*

Originality/value: *The paper provides a comprehensive analysis of Croatia's entrepreneurial environment based on internationally comparable GEM methodology, integrating the NECI index and innovativeness indicators (GII, EIS) into a unique framework, enabling deeper understanding of structural barriers and providing guidelines for public policy creation.*

Keywords: *innovativeness, entrepreneurial environment, Croatia, GII, EIS.*

1. Introduction

In the world of advanced capitalism, success is no longer measured by gaining backstage access; only imagination and authenticity take center stage, and the future, as always, belongs to those in the front row (Ridderstrale and Nordstrom, 2004, p. 31). The competitiveness and long-term sustainability of national economies are driven by entrepreneurship and innovation as key indicators of social development. The empowerment of entrepreneurship and the commercialization of business ideas through innovation

depend on the quality of the institutional framework, the level of cooperation between science and the economy, and policies that incentivize innovation.

Croatia is perceived as a country with a higher level of entrepreneurial activity, especially in the small business sector, with strategic support from institutions (MINPO, 2013, 2014) and access to EU funds. Research, however, points to structural, cultural and institutional challenges, and the environment is described as "non-entrepreneurial" (Švarc, 2004, 2006; Božić, 2011; Jurlin, Samardžija and Sertić, 2018; Marošević and Vukovac, 2021; Kaštelan Mrak and Vretenar, 2024; Singer et al., 2024). Although the concept of smart specialization (MINGO, 2023) and the financial instruments of European Union (EU) funds represent opportunities, their effectiveness requires better policy coordination and more intensive cross-sectoral cooperation. The development of strategic projects such as the project to support the establishment of an Innovation Network for Industry and a Thematic Innovation Platform (INI project) (Banić Tomišić and Crnić Duplančić, 2026) and the continuous monitoring of Croatia's progress on European scoreboards (European Commission, 2026) makes the analysis of the state of the entrepreneurial and innovation environment particularly timely.

The Global Entrepreneurship Monitor (GEM) and the Centre for Small and Medium Enterprise Development Policy (CEPOR) (Singer et al., 2024) reveal a discrepancy between the perception of a supportive environment and low results on internationally comparable scales. There is a lack of systematic analysis that would integrate the indicators of entrepreneurial and innovation activity in Croatia (the NECI index (National Entrepreneurship Context Index) – a composite index of the quality of Croatia's entrepreneurial environment, the TEA index – the Total Entrepreneurial Activity index) and the comparative international scales (GII – Global Innovation Index, EIS – European Innovation Scoreboard) and provide a comprehensive overview of the state of the entrepreneurial and innovation environment in the Republic of Croatia. Therefore, this paper answers the following questions: 1) What is the quality of the entrepreneurial environment in Croatia according to the NECI index and how has it changed during the period from 2018 to 2023? 2) How does Croatia position itself relative to selected European Union member states in terms of innovation indicators (GII and EIS)? and 3) Is there a dynamic relationship between the quality of the entrepreneurial environment and innovativeness? The aim of the paper is based on a comparative analysis of secondary data (GEM, GII, EIS), to identify key structural barriers and provide a systematic overview of the state of the entrepreneurial and innovation environment in Croatia, with implications for public policy. The paper is organized as follows: after the introduction, the theoretical framework and literature review are presented, followed by the methodology, results and discussion, and finally the conclusion.

2. Theoretical predictions

The institutional framework established through strategic documents on entrepreneurship development – the Entrepreneurship Development Strategy of the Republic of Croatia 2013-2020 (MINPO, 2013), the Women's Entrepreneurship Development Strategy 2014-2020 (MINPO, 2014) and the Action Plan for the Implementation of the Strategy (MINPO, 2014), the Innovation Incentive Strategy of the Republic of Croatia 2014-2020 (Government of the Republic of Croatia, 2014), and the Smart Specialisation Strategy of the Republic of Croatia for the period 2016-2020 and the Action Plan for the Implementation of the Strategy (Government of the Republic of Croatia, 2016) – has not led to a long-term sustainable supportive environment. Moreover, after 2020, no new strategy was adopted that would provide guidelines for systematically addressing the current challenges of the entrepreneurial and innovation environment. According to Marošević and Vukovac (2021), unsupportive environment are particularly pronounced in less developed parts of Croatia (e.g., eastern Croatia), where the dominance of the primary sector is not accompanied by institutional support, resulting in further lagging behind in these regions.

The importance of innovation for the sustainability of economic growth (Afuah, 2003) brings to the fore the identification of influential factors in structuring an environment conducive to innovation in the Republic of Croatia (Švarc, 2004; Laleta, 2018; Grčić Fabić, 2022; Crnogaj and Rus, 2023; Kaštelan Mrak and Vretenar, 2024; Singer et al., 2024; Banić Tomišić and Crnić Duplančić, 2026). Among these are: regulatory frameworks, the availability of financial resources for innovative projects, the connection between the academic community and the economy, and the role of state aid and strategic initiatives aimed at fostering innovation (Švarc, 2004). National innovation policies are often focused on formal strategic documents and institutional reforms, but they fail to fully create a supportive environment for entrepreneurs and researchers (MZO, 2023). Their implementation often encounters administrative barriers, system slowness, and a lack of long-term strategic vision, which limits the effectiveness of innovation initiatives (The World Bank, 2023). Reducing the regulatory burden, responsible judicial processes, addressing the risk of corruption, and improving the performance of state-owned enterprises appear to be key to fostering a dynamic business environment (OECD, 2023). Similar conclusions are reached by Marošević and Vukovac (2021), confirming the existence of numerous institutional barriers that directly hinder business operations, such as politicisation, corruption, administrative barriers, tax burdens, and legal uncertainty. Key obstacles to innovation include the limited commercialisation of research results, insufficient private sector investment in research and development, and an unfavourable business environment for the development of start-up companies (Galović, 2016; Laleta, 2018; Grčić Fabić, 2022; Leidecker and Bulman, 2023). The OECD (2023) warns that an additional structural challenge is the insufficient diversification of the economy and a strong reliance on traditional activities, especially tourism, while investments in high tech and knowledge intensive industries remain relatively modest.

Comparative research with transition countries, such as Slovenia and the Czech Republic, shows that significant progress in the field of innovation can be achieved through targeted policies, increased investment in research and development, and strengthening the synergy between the public and private sectors (Crnogaj and Rus, 2023; Ruixia and Yuncheng, 2025). In the context of the current EU strategic framework for research, development and innovation, and the changes compared to the previous Smart Specialisation Strategy (S3) 2016-2020, Banić Tomišić and Crnić Duplančić (2026) confirm the progress of the Republic of Croatia in recent years, but also its position at the tail end of the EU innovation scoreboards and of developed countries at the global level.

The literature review indicates the existence of a significant number of studies pointing to the shortcomings of the entrepreneurial and innovation environment in the Republic of Croatia. However, there is a lack of systematic analyses that integrate GEM, GII and EIS indicators and examine the dynamic relationship between the quality of the entrepreneurial environment and innovativeness. This research aims to fill that gap.

3. Methodology

The applied quantitative research approach is based on secondary data analysis using three databases: GEM, GII and EIS, for the period from 2018 to 2023. The sample consists of 27 European Union countries, with a special focus on Croatia and selected member states for comparative analysis (Slovenia, the Czech Republic, Hungary, Slovakia, Poland, Bulgaria and Romania).

For data processing, descriptive statistics (means, percentages), comparative analysis (comparison of Croatia with the EU average and selected countries), and time series analysis were used. Entrepreneurial activity was analyzed using: the TEA index (the share of the adult population aged 18–64 in the early stages of the entrepreneurial process, including nascent TEA entrepreneurs and new entrepreneurs up to 42 months of activity), the motivational index (the ratio of opportunity-driven to necessity-driven

entrepreneurs; a value >1 is considered favorable), and the NECI index (a value <5 indicates a restrictive environment, while >5 indicates a supportive entrepreneurial environment) (Singer et al., 2024). Innovation capacity was observed through: product and technology innovativeness (the share of TEA entrepreneurs offering a product or service on the market), research and development (R&D) transfer (an assessment of knowledge transfer effectiveness between the scientific and business sectors), and sectoral structure (the share of entrepreneurs in medium and high-tech sectors).

The dynamic relationship between the quality of the entrepreneurial environment and innovativeness is examined using correlation analysis with a time lag of one year (lag 1) (Adomako & Nguyen, 2024; Yuan et al., 2022). Correlations were calculated between the NECI index (and its component R&D transfer) in year t and innovation indicators in year t+1 (the share of innovative TEA entrepreneurs on the national market, the share of TEA entrepreneurs in medium and high-tech sectors, and the share of TEA entrepreneurs with 76–100% of customers outside the country). Due to the methodological break in GEM research in 2019, the analysis involving innovativeness and the share in technology-intensive sectors was conducted for the period 2019–2023 (four pairs for lag 1). For the indicator of exposure to international competition, the period 2018–2023 was used (five pairs). Because of the small number of years, the results are interpreted as indicative rather than as final proof of causality.

4. Result

4.1. Croatia as a (Non-)Entrepreneurial Country – Empirical Insight from the Global Entrepreneurship Monitor

This section presents key indicators of entrepreneurial activity in Croatia based on GEM data for the period 2018–2023. The NECI index records an increase from 3.8 in 2018 to 4.3 in 2023 (Table 1). Despite this increase, throughout the entire period Croatia remains among the countries with the lowest index values compared to other EU member states covered by the GEM research. The average NECI index score at the EU level decreased from 5.1 in 2018 to 4.7 in 2023. Along with the increase in the NECI index value, the gap between Croatia and the EU average narrowed from 1.3 points in 2018 to 0.4 points in 2023. Comparing Croatia with the Netherlands as the leading EU country according to the NECI index, Croatia lagged behind by 2.7 points in 2018. In 2023, Lithuania holds the leading position, and Croatia reduced its gap to 1.8 points.

Table 1: Composite Index of Entrepreneurial Environment Quality in Croatia (NECI Index), 2018-2023*

	2018	2019	2020	2021	2022	2023
Croatia	3.8	3.6	3.7	3.9	4.1	4.3
EU-27	5.1	4.6	4.6	4.9	4.7	4.7
Best EU country	Netherlands (6.5)	Netherlands (6.0)	Netherlands (6.3)	Netherlands (6.3)	Netherlands (5.9)	Lithuania (6.1)
Rank Croatia (EU)**	18/18	17/17	14/14	19/19	16/18	14/18

* Ratings range from 0 to 10 (0 – very poor entrepreneurial environment, 5 – satisfactory entrepreneurial environment, 10 – very good entrepreneurial environment).

** Rank of Croatia / number of countries covered by the GEM research.

Source: Singer et al., 2019; Singer et al., 2022; Singer et al., 2024.

At the global level, according to the NECI index, Croatia ranked 31st out of 49 countries that participated in the GEM research in 2023, while in 2018 it ranked 53rd (Singer et al., 2019; 2024).
The motivational index provides insight into whether entrepreneurs started a business venture motivated by achieving a desired outcome or out of necessity (Singer et al., 2024). According to GEM research (2018; 2023), the motivational index in the Republic of Croatia was 1.94 in 2023, almost at the same level as in 2018 (1.9, compared to the EU average of 3.4). For comparison, the highest motivational index in 2023 was achieved by Sweden (4.23), followed by the Netherlands (3.11) and Germany (2.96). The lowest motivational index was recorded in Poland (1.11), followed by Lithuania (1.40) and Slovakia (1.41).The value of the research and development (R&D) transfer indicator for Croatia was 2.97 in 2018, and it rose to 3.47 in 2023 (Table 2). During the same period, the EU average ranged from 4.17 to 4.49, while the best EU country (the Netherlands, Finland, or Lithuania respectively) achieved values in the range of 5.29 to 6.10. Croatia lagged behind them by a margin ranging from 2.15 to 3.10 points. The smallest gap was recorded in 2022 (2.15 points), and the largest in 2020 (3.10 points, relative to the Netherlands). At the global level, this gap is even larger (4.28 points, relative to the United Arab Emirates (UAE)) (Singer et al., 2024).

Table 2: Research and Development (R&D) Transfer in Croatia*, 2018-2023

GII Croatia	2018	2019	2020	2021	2022	2023
Croatia	2.97	2.75	2.96	3.29	3.36	3.47
EU average	4.20	4.17	4.29	4.49	4.21	4.20
Best EU country	Netherlands (5.29)	Netherlands (5.44)	Netherlands (6.06)	Finland (5.97)	Netherlands (5.51)	Lithuania (6.1)

* values 1–9 (1 – worst, 9 – best)

Source: Singer et al., 2019; Singer et al., 2022; Singer et al., 2024.

Croatia's competitiveness, measured by the innovativeness of entrepreneurs' products and technology, shows a higher level than the EU average of the countries covered by the GEM research, and in 2022 it also recorded the highest level (2.8% compared to the EU average of 1.7%), with a rank of 1/17 (Table 3). Unlike the national level, at the international level countries achieve lower values of the competitiveness indicator (Singer et al., 2024). For Croatia, this value ranged from 0.5% in 2019 to 0.8% in 2023, with a rank of 7/32 in 2023 (according to the number of countries included in the GEM research).

Table 3: Product and Technology Innovativeness in Croatia on the National Market, 2018-2023 (% TEA entrepreneurs)

GII Croatia	2018*	2019	2020	2021	2022	2023
Croatia	13.8	2.5	2.4	2.4	2.8	2.6
EU average	15.7	2.0	1.5	1.5	1.7	1.7
Best EU country	Cyprus (32.2)	Cyprus (4.6)	Slovakia (2.9)	Netherlands (3.5)	Croatia (2.8)	Cyprus (3.2)
Rank Croatia (EU)**	-18/18	3/16	10/16	4/18	1/17	5/18

* Product novelty for customers.

Source: Singer et al., 2019; Singer et al., 2022; Singer et al., 2024.

Entrepreneurial activity in medium and high-tech intensity sectors is one of the indicators of the competitiveness of the Croatian economy (Singer et al., 2024). The share of new (TEA) entrepreneurs in medium and high-tech sectors in Croatia in the period 2019–2023 ranged between 7.4% and 11.8%, with the highest value recorded in 2022 (11.8%). According to this indicator, in 2023 Croatia ranked 3rd among 34 countries covered by the research (Table 4).

Table 4: Entrepreneurs in Medium and High Technology Sectors in Croatia, 2019-2023 (% TEA entrepreneurs)

GII Croatia	2019	2020	2021	2022	2023
Croatia	7.4	11.4	8.8	11.8	10.0
EU average	7.2	8.1	8.3	8.2	8.4
Best EU country	Luxembourg (11)	Slovakia (14.0)	Slovenia (17.1)	Slovenia (17.6)	Slovenia (13.8)
Rank Croatia (EU)**	17/33	4/30	10/31	3/34	7/32

Source: Singer et al., 2019; Singer et al., 2022; Singer et al., 2024.

The exposure of Croatian (TEA) entrepreneurs to international competition (the share of those with 76–100% of customers outside the country) in the period from 2018 to 2023 ranged between 11.0% and 15.8% (Table 5). The highest value was recorded in 2018 (15.8%), and the lowest in 2022 (11.0%). Croatia was above the EU average in all years, and in 2020 it was also the best-ranked country (12.7%).

Table 5: Exposure to International Competition in Croatia, 2018-2023 (76–100% of customers outside the country)

GII Croatia	2018	2019	2020	2021	2022	2023
Croatia	15.8	11.2	12.7	11.3	11.0	14.0
EU average	9.6	7.9	7.3	6.7	8.2	7.1
Best EU country	Luxembourg (23.6)	Luxembourg (16.9)	Croatia (12.7)	Luxembourg (14.2)	Slovenia (13.8)	Luxembourg (15.5)

Source: Singer et al., 2019; Singer et al., 2022; Singer et al., 2024.

In order to examine the dynamic relationship between the quality of the entrepreneurial environment and innovativeness in Croatia, correlation analysis with a time lag of one year (lag 1) was conducted. Correlations were calculated between the NECI index (and its component R&D transfer) in year t and the indicators of innovativeness, the share in medium and high tech sectors, and exposure to international competition in year t+1 (Table 6). A statistically significant, very strong positive correlation was found between the NECI index and research and development (R&D) transfer ($r = 0.946$, $p = 0.015$). The correlations of NECI and R&D transfer with innovativeness, the share in high tech sectors, and exposure to international competition were not statistically significant (r ranging from 0.023 to 0.818, $p > 0.05$).

Table 6: Lag 1 Pearson correlations for Croatia, 2018–2023 (N = 5)

Independent (t) → Dependent (t+1)	r	p
NECI → R&D transfer	0.946*	0.015
NECI → Innovativeness (national market)	0.668	0.218
NECI → High-tech sector	0.023	0.971
NECI → International exposure	0.431	0.469
R&D transfer → Innovativeness	0.818	0.090
R&D transfer → High-tech sector	0.182	0.769
R&D transfer → International exposure	0.225	0.715

* Correlation is significant at the 0.05 level (2-tailed).

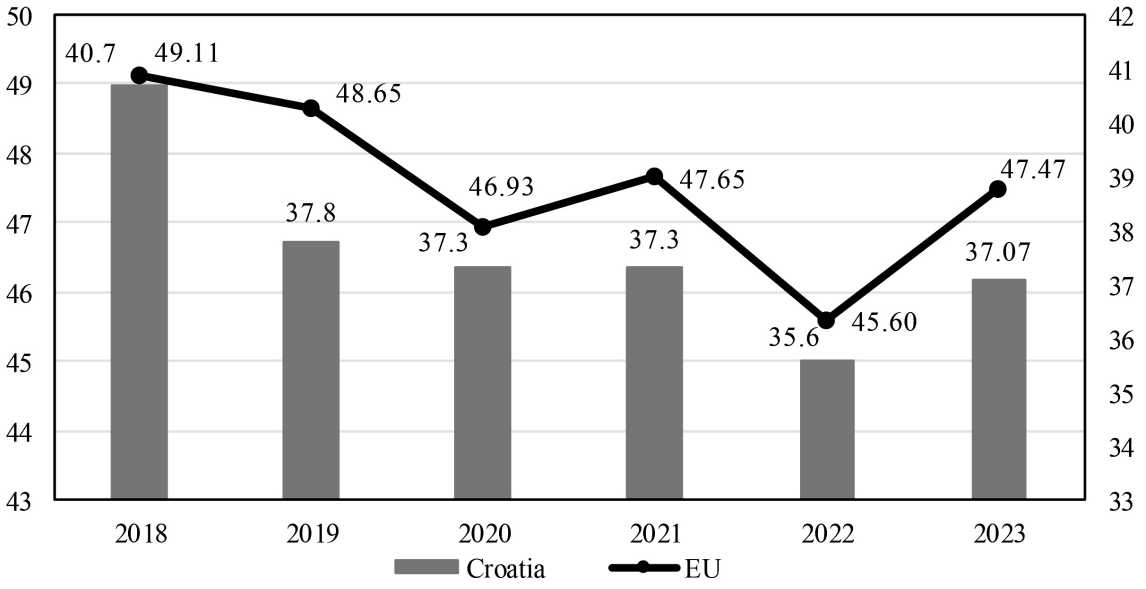
Source: Authors' calculation based on Singer et al., 2019; Singer et al., 2022; Singer et al., 2024.

The following chapter presents the results of the analysis of Croatia's innovation capacities based on GII and EIS data.

4.2. Analysis of Croatia's Innovation Capacity According to the Global Innovation Index and the European Innovation Scoreboard

The innovation performance of the Republic of Croatia, measured by the GII in the period 2018–2023 (Figure 1), ranges from 35.6 to 40.7. The lowest value was recorded in 2022, and the highest in 2018. In 2023, the GII stood at 37.07, which is 1.47 points higher than in 2022. Throughout the entire period, Croatia remained below the EU average. The largest gap was recorded in 2019, amounting to 10.85 points.

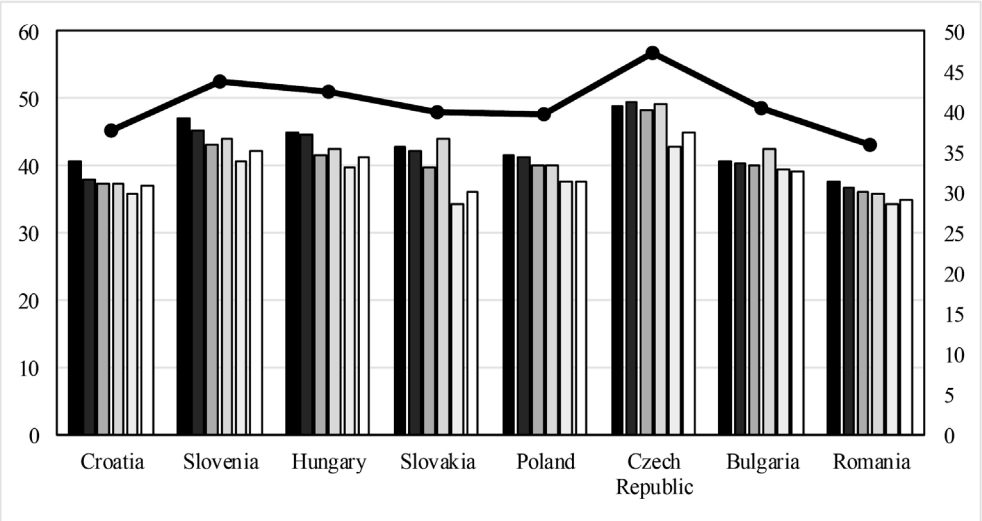
Figure 1: Global Innovation Index of Croatia and EU (average), 2018-2023



Source: Authors' calculation based on: Dutta, Lanvin, Wunsch-Vincent, 2018, 2019, 2020; Dutta et al., 2021, 2022, 2023.

Figure 2 shows the movement of GII values of selected Central and Eastern European countries that, like Croatia, have undergone a transition process, over the period from 2018 to 2023. Most countries recorded a decline in innovation performance from 2020 to 2022, followed by a recovery in 2023. Croatia follows the trends of Hungary, Poland, and Romania, while the Czech Republic and Slovenia have more stable trajectories.

Figure 2: Global Innovation Index of Croatia and selected EU countries, 2018-2023



Source: Authors' calculation based on: Dutta, Lanvin, Wunsch-Vincent, 2018, 2019, 2020; Dutta et al., 2021, 2022, 2023.

Table 7 presents Pearson correlation coefficients between Croatia's GII values and selected Central and Eastern European countries. The highest correlation was recorded with Slovenia (r = 0.917), and the lowest with the Czech Republic (r = 0.627). Although Croatia shows moderate to strong correlations with all countries, statistically significant correlations are found with Slovenia (r = 0.917, p = 0.010), Hungary (r = 0.863, p = 0.027), and Romania (r = 0.899, p = 0.015). The correlation with Slovenia is significant at the $p < 0.01$ level, while those with Hungary and Romania are significant at the $p < 0.05$ level.

Table 7: Correlations analysis GII Croatia and selected EU countries

GII Croatia	Slovenia	Hungary	Slovakia	Poland	Czech Republic	Bulgaria	Romania
Pearson Correlation	0.917**	0.863*	0.656	0.794	0.627	0.307	0.899*
Sig. (2-tailed)	0.010	0.027	0.157	0.059	0.182	0.554	0.015
N	6	6	6	6	6	6	6

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Source: Authors' calculation based on: Dutta, Lanvin, Wunsch-Vincent, 2018, 2019, 2020; Dutta et al., 2021, 2022, 2023.

The global innovation framework can be conceptually observed through three fundamental development areas of national economies: investment in science and innovation, the degree of adoption of new technologies, and their socio economic impact (The Global Economy.com, 2025), presented for Croatia in Table 8 for the period 2013–2023. The data indicate changes in key indicators of innovation activity in Croatia in the short term (2022–2023) and the long term (2013–2023). The most dynamic growth is achieved by international patents and venture capital, while scientific publications record a decline. In the field of technological innovations, the growth of robotics stands out, while security and logistics have almost stagnated. The socio economic effects of innovation remain modest, with the lowest growth rates in labour productivity and life expectancy, while the increase in average air temperature is the most pronounced.

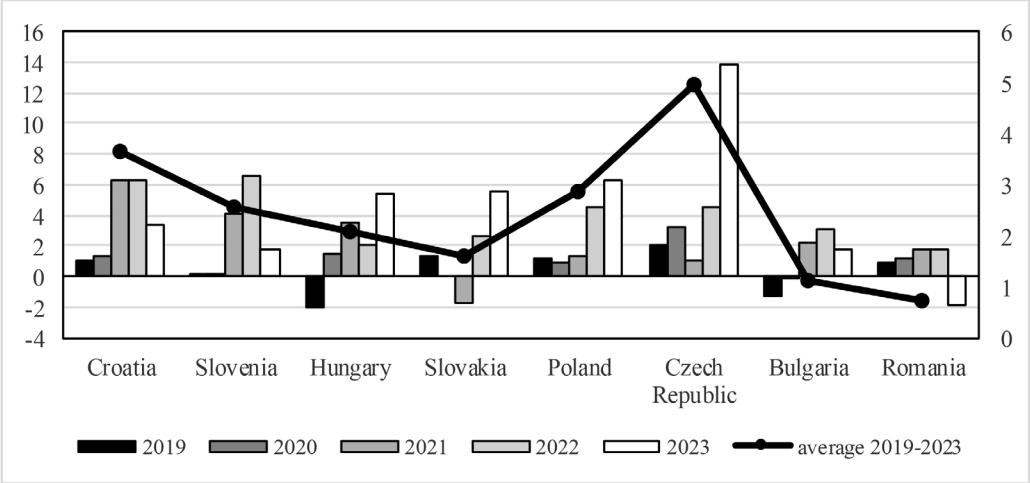
Table 8: Index of Investment in Science and Innovation, Adoption of New Technologies, and Socio-Economic Impact, 2013-2023 (%)

Investment in Science and Innovation	Scientific publications	R&D	Venture capital	International patents
2022-2023	-5.7	21	20	152.6
2013-2023	3.7	9.4	11.6	0.9
Technological Innovations	Security and Logistics	Connectivity	Robotics	Electric Vehicles
	0.1	4.5	21	-
Socio-Economic Impact	Labor Productivity	Life Expectancy	Changes in Air Temperature	
	0.9	1.5	2.6	

Source: The Global Economy.com, 2025.

The GII focuses on the global comparison of innovation capacities. In contrast, the EIS provides a more detailed insight into Croatia's position within the European Union based on multidimensional indicators. In 2023, Croatia was classified as a moderate innovator (together with Estonia, Slovenia, the Czech Republic, Italy, Spain, Malta, Portugal, Lithuania, Greece and Hungary), achieving significant progress compared to 2022, when it belonged to the group of emerging innovators (European Commission, 2026). In 2023, Croatia achieved a total of 79.5 points and an increase of 3.3 points compared to 2022. In the period 2019–2023, Croatia recorded its largest annual growth of the EIS index in 2021 and 2022 (6.3 points), and 3.3 points in 2023 (Figure 3). The Czech Republic recorded a sharp increase in 2023 (13.9 points) and ranks first in terms of average EIS index growth in the period 2019–2023. Croatia positions itself behind the Czech Republic (4.94 points), but ahead of Poland (2.86 points) and Slovenia (2.54 points). Romania had the lowest EIS growth (0.74 points). With 102.5 points (Slovenia) and 99.1 points (Czech Republic), both countries are significantly ahead of Croatia in 2023.

Figure 3: Comparison EIS index of Croatia and selected EU countries, 2019-2023



Source: Source: Authors' calculation based on: European Commission, 2026.

Despite the positive changes, Croatia significantly lags behind the group of EU innovation leaders (e.g., Denmark with 155.5 points, Sweden 153.3 points) and the group of strong innovators (e.g., Austria 129.0 points, Ireland 128.1 points). By correlating the EIS values of Croatia and selected Central and Eastern European countries (Table 9), statistically significant correlations can be observed at the $p < 0.01$ level with Slovenia, Poland, the Czech Republic, and Bulgaria, and at the $p < 0.05$ level with Hungary and Romania, while the correlation with Slovakia is not statistically significant.

Table 9: Correlations analysis EIS Croatia and selected EU countries

EIS Croatia	Slovenia	Hungary	Slovakia	Poland	Czech Republic	Bulgaria	Romania
Pearson Correlation	0.991**	0.952*	0.739	0.951**	0.907**	0.952**	0.856*
Sig. (2-tailed)	<0.001	0.003	0.093	0.004	0.004	0.003	0.030
N	6	6	6	6	6	6	6

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Source: Authors' calculation based on: European Commission, 2026.

5. Discussion

According to GEM research, Croatia has improved the quality of its entrepreneurial environment, measured by the increase in the NECI index value. The reduction of the gap behind the EU average from 1.3 points to 0.4 points (2018–2023) is partly a result of a slight decrease in the average NECI value for the EU (from 5.1 to 4.7). Therefore, the improvement cannot be attributed exclusively to domestic reforms, but also to unfavourable trends in other countries. The Netherlands, for example, recorded a decline in NECI values from 6.5 to 5.90 (2018–2023), and France from 5.6 to 5.0 (GEM,

2018, 2023). Croatia's NECI value (4.3 in 2023) remains below the threshold of 5 points (Singer et al., 2024) and ranks among the countries with the lowest NECI values. The gap relative to leading EU countries remains large, showing that the generally slow changes in the institutional and cultural context (Rietveld & Patel, 2023) also apply to Croatia.

The entrepreneurial environment remains demotivating, especially for opportunity driven entrepreneurs, who are crucial for growth and innovation, and past policies and strategic documents (MINPO, 2013, 2014; Government of the Republic of Croatia, 2016) have had a limited effect on actual improvement of the institutional framework. This is particularly reflected in research and development (R&D) transfer as one of the weakest components of the entrepreneurial environment according to GEM (2023). Although results show improvements, the values are only about 83% of the European Union average (3.47 compared to 4.20 in 2023), and the gap behind leading countries (Lithuania, the Netherlands, Finland) ranges from 2.15 to 3.10 points over the 2018–2023 period. At the global level, the gap is even larger (4.28 points relative to the United Arab Emirates; Singer et al., 2024).

The lack of stronger cooperation between the research science sector and the business sector is one of the limiting factors for knowledge commercialisation (MZO, 2022). The level of knowledge transfer from universities and institutes to enterprises is low (Švarc, 2004; Božić, 2011; The World Bank, 2023). This is also highlighted by the European Commission, which in 2023 issued a series of recommendations for improving the research and innovation system in the Republic of Croatia, including promoting cooperation between the business sector and the research science community and strengthening knowledge valorisation, i.e., technology transfer and entrepreneurship within the research science community (Banić Tomišić & Crnić Duplančić, 2026).

The value of the motivational index shows that entrepreneurs undertake their business ventures more out of necessity than out of a desire to achieve desired outcomes. Regarding this indicator, Croatia is at the bottom of the list, among the countries with the lowest motivational index (Poland, Lithuania and Slovakia). Although the motivational index improved in 2023 (1.94) compared to 2022 (1.66), Croatia is significantly behind countries with the best motivational index (4.23 in Sweden), and the number of people entering self employment or starting a business venture because of perceived opportunities is still insufficient (Singer et al., 2024). The index shows that in Croatia 1.94 times more business ventures were started because of perceived opportunities, while in Sweden the figure is 4.23 times more. This raises the question of how to increase the number of people who will base their business venture on perceived opportunities and what the role of institutions is in these processes (access to finance, government development policies, cooperation between the research and business sectors, etc.).

Innovativeness and technology intensity indicators show, on the one hand, above average results at the national level, but with the limitation of a very small number of entrepreneurs and without transfer to global competitiveness. In 2022, Croatia reached the highest level of innovativeness in the national market (2.8% of TEA entrepreneurs), but with a very low share of innovative entrepreneurs (less than 3% of all TEA entrepreneurs). The existence of a small base of innovative entrepreneurs with very high potential who succeed in developing new products and technologies is evident. This implies a lack of systemic encouragement of broader innovative activity. Reasons may include lack of access to seed capital, weak connection with research science institutions, and insufficient support for prototype development. In the international market, however, the competitiveness of innovative Croatian entrepreneurs is significantly lower than at the national level (0.8% compared to 2.8%). This indicates a local orientation of the innovation potential of Croatian companies without the driving force to enter and compete in foreign markets, which requires specific knowledge and skills, as well as human, financial, material and technological resources (Kolaković, 2018).

The share of TEA entrepreneurs in medium and high tech sectors in the Republic of Croatia ranks Croatia 7th out of 34 countries covered by GEM research in 2023, with a significant positive increase from 7.4% to 11.8% since 2018. However, in comparison with Slovenia, Croatia lags significantly. Croatia has the potential to develop technology intensive entrepreneurship, but faces limitations such as insufficient linkage between science and the economy (indicated by low R&D transfer), a lack of specialised funds for start ups, and a low level of infrastructure development (incubators, technology parks) in the wider area of Croatia. Unlike Croatia, the growth of the share of entrepreneurs in high tech activities in the Republic of Slovenia (13.8% in 2023) reflects efforts to develop a system of numerous institutions responsible for implementing research, development and innovation policies, which have been largely shaped according to observed good practices in European Union countries (especially the Scandinavian ones), as well as various consulting missions supported by the European Commission over the last two decades (Bučar, 2024).

GEM indicators point to a high exposure of Croatian TEA entrepreneurs to foreign markets, with the share of those having 76 100% of customers outside Croatia ranging from 11.0% to 15.8% (2018 2023). In 2023, this share was 14.0%, almost twice the EU average, and in 2020 Croatia held the leading position. However, these results only seemingly suggest a high level of Croatia's competitiveness in the international market. The high exposure of Croatian TEA entrepreneurs to foreign markets is largely a consequence of domestic market constraints, such as market saturation and size. Kolaković (2018) suggests this, pointing out that entrepreneurs from a small domestic market and level of economic development, such as Croatia's, seek business opportunities in foreign markets to ensure long term sustainability.

The statistically significant, very high correlation between the NECI index and R&D transfer ($r = 0.946$, $p = 0.015$) confirms that improvements in the general entrepreneurial environment are closely linked to more effective knowledge transfer. In contrast, the absence of statistically significant correlations of NECI and R&D transfer with innovativeness, high tech sectors, and exposure to competition indicates that the effects of the environment on innovativeness outcomes, the high tech sector, and exposure to competition require a longer time period than one year or are more strongly influenced by other factors (e.g., access to finance, education).

The results of the innovation capacity analysis, based on GII and EIS data, confirm Croatia's lag behind the EU average, but also some progress in the European environment (Dutta et al., 2023; European Commission, 2026). These findings follow the previously established dynamics of the NECI index, which indicates the existence of a small but promising entrepreneurial base. Croatia's long term lag as measured by the GII indicates structural weaknesses: insufficient investment in R&D, weak cooperation between science and the economy (Leidecker & Bulman, 2023), which, according to the NECI index, are caused by the low quality of the entrepreneurial environment. The OECD (2023) warns that an additional structural challenge is the insufficient diversification of the economy and a strong reliance on traditional activities, especially tourism, while investment in high tech and knowledge intensive industries remains relatively modest. The recovery of the GII in 2023 cannot compensate for the long term gap behind the EU average, indicating the need for strategic investment in innovation infrastructure.

The movement of GII values for selected transition countries shows that most of them suffered a decline in innovation performance between 2020 and 2022, primarily due to the COVID 19 pandemic, supply chain disruptions, and rising energy prices. All countries recorded a recovery in 2023, but its strength depends on the resilience of individual innovation systems. Croatia follows Hungary, Poland, and Romania – countries that share similar structural challenges (insufficient R&D investment, weak science economy linkages). In contrast, Slovenia and the Czech Republic record more stable and less fluctuating changes in GII values, reflecting their earlier and stronger

integration into the European research network and greater institutional resilience. The long term sustainability of the innovation system is crucial for strengthening the institutional framework and increasing resilience to external shocks. Jurlin, Samardžija and Sertić (2018) emphasise the need to improve the institutional framework and ensure more stable conditions for innovation activities, including more efficient use of funds from European Union sources.

Correlation analysis of GII values showed that Croatia has a high and statistically significant correlation with Slovenia, Hungary and Romania, which can be attributed to the similar regulatory standards of these three countries and their access to cohesion funds for digitalisation and innovation. Driven by the same sources of funding, entrepreneurial ecosystems follow similar cycles. In addition, Croatia's connectivity with Slovenia and Hungary is accompanied by foreign trade partnerships and territorial proximity, so that innovation growth in Slovenia and Hungary often spills over to Croatian suppliers. Correlations with Poland, Slovakia, the Czech Republic and Bulgaria are not statistically significant. Poland, Slovakia and the Czech Republic have diverged from regional patterns thanks to industrial growth, while Bulgaria lags significantly in innovation. EIS data show that in 2023 Croatia is in the group of "moderate innovators" (previously "emerging innovator") (European Commission, 2026), which is significant progress. A comparison with EU countries that, like Croatia, have undergone a transition process shows that Croatia still lags significantly behind the Czech Republic and Slovenia, and a comparison with "innovation leaders" (Denmark and Sweden) and "strong innovators" (Austria, Ireland) further confirms the shortcomings of the innovation environment in the Republic of Croatia. The results achieved by different countries in different EIS and GII indices point to different behaviour of innovation ecosystems (Coutinho & Au Yong Oliveira, 2023). Different indicators included in the indices result in different relationships between the analysed countries. EIS correlations show higher values than GII correlations. Correlation analysis shows that Croatia's innovation performance follows most countries of Central and Eastern Europe. This is understandable given that all are under the influence of the same EU policies (smart specialisation, cohesion funds) and face similar structural constraints. According to Kaštelan Mrak and Vretenar (2024), Croatia has the potential to strengthen its innovation capacities through smart specialisation strategies and targeted investments in technologically advanced sectors. Despite this, structural challenges remain, including bureaucratic obstacles, limited financing mechanisms for start ups, and a lack of a stimulating business environment for innovation. In addition to institutional constraints, the brain drain of highly educated workforce also poses a problem, further reducing national innovation capacities. Švarc (2006) points out that political instability, together with unclearly defined strategic priorities in the field of science and technology, results in ineffective innovation policy. Božić (2011) further warns that the key obstacles to innovation in Croatian companies are related to the lack of financial resources, low risk tolerance, and poorly developed knowledge transfer mechanisms between the academic and business sectors.

The foregoing analysis points to the key role of cooperation between the private sector and scientific institutions in strengthening the innovation ecosystem. These models enable effective transfer of research results to industry, while simultaneously providing scientific institutions with the opportunity for practical application of theoretical knowledge (Samardžija & Butković, 2010). The OECD (2023) emphasises that these models can improve the global competitiveness of countries, including Croatia. Nevertheless, as already noted, cooperation between universities and business entities is weak, as confirmed by the low R&D transfer values. The main motives for cooperation, such as access to advanced technologies, exchange of resources and expertise, and increasing competitiveness (The World Bank, 2023; The Global Economy.com, 2025), are largely unused. Table 10 summarises the advantages and challenges of cooperation.

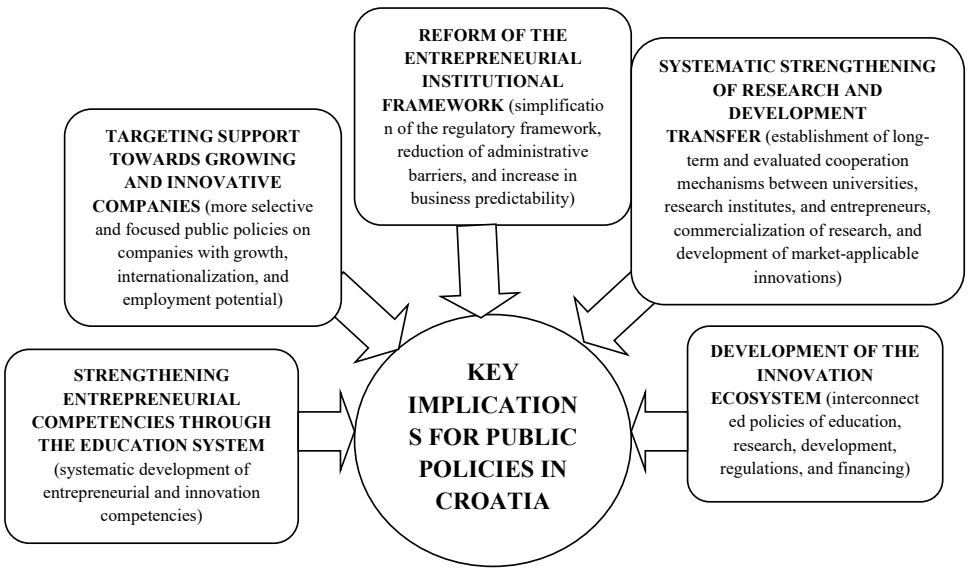
Table 10: Advantages and Challenges of Cooperation Between the Private Sector and Scientific Institutions in Croatia

Advantages	Challenges
Faster commercialization of innovations	Different goals and interests
Better alignment of research with market needs	Intellectual property issues
Increased competitiveness	Financial challenges
Exchange of resources and expertise	Complicated negotiation and contracting processes
Creation of new jobs	Cooperation culture can be challenging (e.g., academic vs. commercial approaches)

Source: Author's adaptation based on MZO, 2023; AZVO, 2023; Dutta et al., 2022.

The advantages of cooperation between the private sector and scientific institutions, such as faster commercialisation of innovations and better alignment of research activities with market needs, clearly indicate the potential of this model in improving the competitiveness of the private sector (Government of the Republic of Croatia, 2021). On the other hand, challenges such as divergence of goals between the private sector and academic institutions, complexity in managing intellectual property, financial barriers, and complicated negotiation processes often hinder the establishment of effective cooperation. Additional problems are seen in the lack of a cooperation culture and the misalignment of academic and commercial approaches, which points to the need for systematic action (Bogers, 2018). To overcome these obstacles, coordinated and long-term public policies that connect education, research, regulation and financial instruments are needed, contributing to sustainable development, the improvement of innovation capacity, and the creation of an innovative and competitive society. Scheme 1 summarises the key action priorities.

Scheme 1: Proposal of Key Guidelines for Croatian Public Policies Based on Empirical Findings



Source: Author's.

Without coordinated and long-term public policies that connect education, research, regulation, and financial instruments, Croatia will remain a country with limited innovation capacity and insufficiently utilized entrepreneurial potential.

6. CONCLUSION

The research results show certain improvements in the quality of the entrepreneurial environment in the Republic of Croatia, but it still does not reach the European Union average. The NECI indicator values in the period between 2018 and 2023 show that it is below the minimum threshold that indicates a supportive entrepreneurial environment and can therefore be assessed as restrictive rather than supportive. The improvement in the NECI index value is partly influenced by changes in the entrepreneurial environment in other EU countries and is not exclusively a reflection of implemented reforms. The reduction of the gap towards the EU average is partly a consequence of the decline in the EU average value. GII and EIS indicators also point to a non supportive entrepreneurial environment when observed through innovation potential. Nevertheless, progress is visible in Croatia's shift from the group of "emerging innovators" to the group of "moderate innovators", with an emphasis on the significant growth of EIS values in 2021 and 2022. However, it still lags behind the Czech Republic and Slovenia – countries that have undergone a similar transition path – and the lag behind innovation leaders such as Denmark and Sweden is particularly significant. Correlation analysis reveals a link between the improvement in the quality of the entrepreneurial environment and R&D transfer, which is understandable since it is a component of the quality of the entrepreneurial environment; however, their correlation with other analysed segments – such as innovativeness, the high tech sector and exposure to competition – is not statistically significant, suggesting that the effects of the environment do not yield positive results in the short term or that they are influenced by other factors, such as financing or education. Based on the conducted research, key implications for public policies in the Republic of Croatia in the area of improving the quality of the entrepreneurial environment have been identified: reform of the entrepreneurial institutional framework, systematic strengthening of R&D transfer, development of the innovation ecosystem, and strengthening of entrepreneurial competences through the education system.

The contribution of the research is reflected in a comprehensive analysis of the entrepreneurial environment in Croatia based on the internationally comparable GEM methodology, integrating the NECI index and the innovativeness indicators of the GII and EIS into a unique framework, enabling a deeper understanding of structural barriers and providing guidelines for public policy creation.

The limitation of the research lies in the time frame of the analysis (2018 2023) and the methodological discontinuity of GEM data for 2018, so due to the small number of observations (N=5) the results are interpreted as indicative rather than as final proof of causality. Furthermore, the work is based on aggregated national and secondary data from GEM, GII and EIS, which prevents the analysis of the quality of the entrepreneurial environment at the regional level and the identification of differences between regions. The research also does not provide cause and effect relationships, and the results apply only to the Republic of Croatia without the possibility of being applied to other countries. However, the work can serve as a basis for further research that could be extended to longer time series, more countries included in the study, as well as other variables, such as GDP, unemployment rate or investment in education, as factors influencing entrepreneurial and innovation activity.

7. REFERENCES

1. Adomako, S., Nguyen, N. P. (2024) Collaborative entrepreneurship and social innovation performance: Effects of institutional support and social legitimacy. Corporate Social Responsibility and Environmental Management, Vol. 31, No. 6, pp. 5881-5893. https://doi.org/10.1002/csr.2900
2. Afuah, A. (2003) Innovation Management Strategies, Implementation and Profits. Oxford: Oxford University Press.
3. AZVO (2023) Godišnje izvješće 2023 [Annual Report 2023], https://www.azvo.hr/wp-azvofiles/Agencije-za-znanost-i-visoko-obrazovanje.pdf
4. Banić Tomišić, Z., Crnić Duplančić, I. (2026) Istraživanje, razvoj i inovacije u Hrvatskoj (drugi dio) – Nacionalni inovacijski sustav i Strategija pametne specijalizacije do 2029. [Research, Development and Innovation in Croatia (Part Two) – National Innovation System and Smart Specialisation Strategy until 2029]. Kemija u industriji, Vol. 75, No. 1-2, pp. 51-82. https://hrcak.srce.hr/342974
5. Bogers, M. (2018) Innovating by doing: promoting on-the-job experimentation through a climate for innovation. International Journal of Entrepreneurial Venturing, Vol. 10, No. 3, pp. 362-382. https://doi.org/10.1504/IJEV.2016.10006916
6. Božić, Lj. (2011) Constraints to Innovation Activities in Croatian Enterprises. Ekonomski pregled, Vol. 62, No. 3-4, pp. 177-189. https://hrcak.srce.hr/67212
7. Bučar, M. (2024) Significant Improvement but Also Missed Opportunities: Slovenian Innovation Policy from 2004 to 2024. In: Kaeding, M., Udovič, B. (Eds.) Slovenia and the EU: 20 Years of Membership in Perspective. Cham: Springer Nature Switzerland, (pp. 33-39). https://link.springer.com/chapter/10.1007/978-3-031-61605-1_5
8. Coutinho, E. M. O., Au-Yong-Oliveira, M. (2023) Factors Influencing Innovation Performance in Portugal: A Cross-Country Comparative Analysis Based on the Global Innovation Index and on the European Innovation Scoreboard. Sustainability, Vol. 15, No. 13, 10446. https://doi.org/10.3390/su151310446
9. Crnogaj, K., Rus, M. (2023) From Start to Scale: Navigating Innovation, Entrepreneurial Ecosystem, and Strategic Evolution. Administrative Sciences, Vol. 13, No. 12, 254. https://doi.org/10.3390/admsci13120254
10. Dutta, S., Lanvin, B., Rivera León, L., & Wunsch-Vincent, S. (2021) Global Innovation Index 2021: Tracking Innovation through the COVID-19 Crisis. Geneva: WIPO. https://www.wipo.int/publications/en/series/index.jsp?id=129
11. Dutta, S., Lanvin, B., Rivera León, L., & Wunsch-Vincent, S. (2022) Global Innovation Index 2022, What is the future of innovation – driven growth?. Geneva: WIPO. https://www.wipo.int/en/web/global-innovation-index/2022/index
12. Dutta, S., Lanvin, B., Rivera León, L., & Wunsch-Vincent, S. (2023) Global Innovation Index 2023: Innovation in the face of uncertainty. Geneva: WIPO. https://www.wipo.int/publications/en/series/index.jsp?id=129
13. Dutta, S., Lanvin, B., Wunsch-Vincent, S. (2018) Global Innovation Index 2018: Energizing the World with Innovation. Geneva: Cornell University, INSEAD, WIPO. https://www.wipo.int/publications/en/series/index.jsp?id=129
14. Dutta, S., Lanvin, B., Wunsch-Vincent, S. (2019) Global Innovation Index 2019: Creating Healthy Lives – The Future of Medical Innovation. Geneva: Cornell University, INSEAD, WIPO. https://www.wipo.int/publications/en/series/index.jsp?id=129

15. Dutta, S., Lanvin, B., Wunsch-Vincent, S. (2021) Global Innovation Index 2021: Who Will Finance Innovation? Geneva: Cornell University, INSEAD, WIPO. https://www.wipo.int/publications/en/series/index.jsp?id=129
16. European Commission (2026) European Innovation Scoreboard. https://projects.research-and-innovation.ec.europa.eu/en/statistics/performance-indicators/european-innovation-scoreboard/eis#/eis?country_scope=eu&year=2022
17. Galović, T. (2016) Uvod u inovativnost poduzeća [Introduction to Corporate Innovativeness] Rijeka: Ekonomski fakultet Sveučilišta u Rijeci.
18. GEM (Global Entrepreneurship Monitor) (2018) Global Entrepreneurship Monitor, 2018/2019 Global Report. London: GEM. https://www.gemconsortium.org/file/open?fileId=51377
19. GEM (Global Entrepreneurship Monitor) (2023) Global Entrepreneurship Monitor 2023/2024 Global Report: 25 Years and Growing. London: GEM. https://www.gemconsortium.org/file/open?fileId=51377
20. Government of Republic of Croatia (2014) Strategija poticanja inovacija Republike Hrvatske 2014.-2020. [Innovation Promotion Strategy of the Republic of Croatia 2014-2020]. Narodne novine, No. 153.
21. Government of the Republic of Croatia (2016) Strategija pametne specijalizacije Republike Hrvatske za razdoblje od 2016. do 2020. godine i Akcijski plan za provedbu Strategije pametne specijalizacije Republike Hrvatske za razdoblje od 2016. do 2017. godine [Smart Specialisation Strategy of the Republic of Croatia for the period 2016–2020 and Action Plan for the Implementation of the Smart Specialisation Strategy of the Republic of Croatia for the period 2016–2017]. https://mzom.gov.hr/UserDocsImages//dokumenti/EUfondovi/OPKK_2014-2020//Strategija %20pametne%20specijalizacije%20Republike%20Hrvatske%20za%20razdoblje%20od%202016.%20-%202020.%20godine.pdf
22. Government of the Republic of Croatia, Ministry of Economy and Sustainable Development (MINGO) (2023) Smart Specialization Strategy 2029. Zagreb: Government of the Republic of Croatia, Ministry of Economy. https://mingo.gov.hr/strategija-pametne-specijalizacije-do-2029/9839
23. Government of the Republic of Croatia, Ministry of Entrepreneurship and Crafts (MINPO) (2013) Entrepreneurship Development Strategy in the Republic of Croatia 2013–2020. Narodne novine, No. 136.
24. Government of the Republic of Croatia, Ministry of Entrepreneurship and Crafts (MINPO) (2014) Odluka o donošenju Strategije razvoja poduzetništva žena u Republici Hrvatskoj, za razdoblje od 2014. do 2020. godine i Akcijskog plana za provedbu Strategije razvoja poduzetništva žena u Republici Hrvatskoj, za razdoblje od 2014. do 2020. godine [Decision on the Adoption of the Women's Entrepreneurship Development Strategy in the Republic of Croatia for the period from 2014 to 2020 and the Action Plan for the Implementation of the Women's Entrepreneurship Development Strategy in the Republic of Croatia for the period from 2014 to 2020]. Narodne novine, No. 77.
25. Grčić Fabić, M. (2022) Perspectives and Challenges in the Development of the Croatian Digital Startup Sector. In: Olgić Draženović, B., Buterin, V., Suljić Nikolaj, S. (Eds.) Real and Financial Sector in Post-Pandemic Central and Eastern Europe. Springer International Publishing: pp. 139-156.

26. Jurlin, K., Samardžija, V., Sertić, M. B. (2018) Competitiveness, Smart Specialisatio and Investment in new EU Member States and Croatia. Zagreb: Institute for Development and International Relations – IRMO.
27. Kaštelan Mrak, M., Vretenar, N. (2024) Future Prospects for Jumpstarting Technological Innovation in Enhancing the Competitiveness of Croatia Business Sector. The Fourteenth International Conference: "Challenges of Europe: Design for the next generation", pp. 1-25. https://urn.nsk.hr/urn:nbn:hr:192:796037
28. Kolaković, M. (2018) Strateški pristup izlasku poduzetnika na međunarodno tržište [Strategic approach to entrepreneurs' international market entry]. Zbornik sveučilišta Libertas, Vol. 3, pp. 107-123. https://hrcak.srce.hr/file/288776
29. Laleta, S. (2018) Innovation and growth of skills: Challenges to the Croatian Legislature. Zbornik Pravnog fakulteta Sveučilišta u Rijeci, Vol. 39, No. 4, pp. 1851-1880. https://doi.org/10.30925/zpfsr.39.4.14
30. Leidecker, T., Bulman, T. (2023) Improving the business environment to accelerate convergence in Croatia. OECD Economics Department Working Papers, No. 1783, pp. 1–44. https://dx.doi.org/10.1787/3c89c005-en
31. Marošević, K., Vukovac, L. (2021) Institutions and economic development: theoretical perspective of missed institutional support in the Republic of Croatia. Pravni vjesnik, Vol. 37, No. 3-4, pp. 201-225. https://hrcak.srce.hr/file/390938
32. Ministarstvo znanosti i obrazovanja Republike Hrvatske (MZO) (2022) Nacionalne smjernice za transfer tehnologije i znanja [National Guidelines for Knowledge and Technology Transfer], Zagreb: Ministarstvo znanosti i obrazovanja.
33. Ministarstvo znanosti i obrazovanja Republike Hrvatske (MZO) (2023) Nacionalni plan razvoja sustava obrazovanja za razdoblje do 2027. godine [National Education System Development Plan until 2027]. Zagreb: MZO. https://mzom.gov.hr/UserDocsImages/dokumenti/Obrazovanje/AkcijskiINacionalniPlan/Nacionalni-plan-razvoja-sustava-obrazovanja-za-razdoblje-do-2027.pdf
34. OECD (2023) OECD Economic Surveys: Croatia 2023. Paris: OECD Publishing. https://www.oecd.org/en/publications/oecd-economic-surveys-croatia-2023_4f945053-en.html
35. Ridderstrale, J., Nordstrom, K. A. (2004) Karaoke kapitalizam – menadžment za čovječanstvo [Managing for Mankind]. Zagreb: Differo.
36. Rietveld, C. A., Patel, P. C. (2023) A critical assessment of the National Entrepreneurship Context Index of the Global Entrepreneurship Monitor. Entrepreneurship Theory and Practice, Vol. 47, No. 6, pp. 2494-2507. https://doi.org/10.1177/10422587221134928
37. Ruixia, J., Yuncheng, T. (2025) Innovation Development and the Role of Government in Central and Eastern European EU Member States in Changing Times: The Czech Republic as an Example. China Watch, Vol. 5, No. 41, pp. 1-13. https://china-cee.eu/2025/11/05/innovation-development-and-the-role-of-government-in-central-and-eastern-european-eu-member-states-in-changing-times-the-czech-republic-as-an-example/
38. Samardžija, V., Butković, H. (Eds.) (2010) From the Lisbon Strategy to Europe. Zagreb: Institute for International Relations.
39. Singer, S. et al. (2019) Što čini Hrvatsku (ne)poduzetničkom zemljom? GEM Hrvatska 2018 [What makes Croatia a (non)entrepreneurial country? GEM Croatia 2018]. Osijek: CEPOR. https://www.cepor.hr/wp-content/uploads/2019/04/GEM2018zaweb.pdf

40. Singer, S. et al. (2022) Što čini Hrvatsku (ne)poduzetničkom zemljom? GEM Hrvatska 2021 [What makes Croatia a (non)entrepreneurial country? GEM Croatia 2021]. Osijek: CEPOR. https://www.cepor.hr/wp-content/uploads/2022/06/GEM-publikacija-2021-WEB.pdf
41. Singer, S. et al. (2024) Što čini Hrvatsku (ne)poduzetničkom zemljom? GEM Hrvatska 2023 [What makes Croatia a (non)entrepreneurial country? GEM Croatia 2023]. Osijek: CEPOR. https://www.cepor.hr/gem-global-entrepreneurship-monitor/
42. Švarc, J. (2004) Innovation Policy in Croatia: the First 10 Years, Proceedings of the 65th Anniversary Conference of the Institute of Economics, Zagreb: Ekonomski institut, pp. 379–403.
43. Švarc, J. (2006) Socio-political factors and the failure of innovation policy in Croatia as a country in transition, Research Policy, Vol. 35, No. 1, pp. 144–159. https://doi.org/10.1016/j.respol.2005.09.002
44. The Global Economy.com (2025) Croatia: Innovation index. https://www.theglobaleconomy.com/Croatia/GII_Index/
45. The World Bank (2023) Croatia: Country Economic Memorandum, Laying the foundations: Boosting productivity to ensure future prosperity. https://documents1.worldbank.org/curated/en/099131501272380831/pdf/P175222014daa00420a5b30388d19e66add.pdf
46. Vlada Republike Hrvatske [Government of the Republic of Croatia] (2021) Nacionalna razvojna strategija Republike Hrvatske do 2030. godine [National Development Strategy of the Republic of Croatia until 2030]. Narodne novine, No. 13.
47. Yuan, X., Li, Y., Wang, D. (2022) Time lagged investigation of entrepreneurship school innovation climate and students' motivational outcomes. Frontiers in Psychology, Vol. 13, No. 979562, pp. 1-14. https://doi.org/10.3389/fpsyg.2022.979562