

THE RELATIONSHIP BETWEEN ECONOMIC GROWTH AND THE RULE OF LAW

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ABSTRACT

Economic growth is of fundamental importance for citizens and businesses of national economies, as it forms the basis for increasing prosperity. Without an appropriate legal environment, national economies struggle to achieve economic growth. The study, focusing on the European Union, examines the close relationship between economic growth and the rule of law in EU Member States in 2012-2022. The study uses Pearson correlation, classical clustering, and regression analysis. The results of both analyses show no robust and linear relationship between economic growth and the rule of law in EU Member States. The previous finding means that in those Member States that achieved higher economic growth, the level of rule of law did not necessarily increase during the period under study and vice versa. The results of the multivariate analysis show that although the rule of law alone did not robustly determine GDP growth, it appears as a relevant factor together with other factors (in interaction). Another study result is that the initial state of the national economy under study is decisive in the growth of GDP production because it is relatively more straightforward to achieve more dynamic growth from a lower GDP. The policy recommendation of the study is that the EU should consider that, although the direct impact of the rule of law on GDP has not been proven to be strong, maintaining the rule of law is essential for long-term economic stability and investment.

Key words: economic growth; rule of law; European Union; correlation; clusters.

1. INTRODUCTION

The regulatory environment and the quality of legislation are critical factors in the economic development of a national economy and the European Union. A well-developed, stable legal environment based on a national consensus

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promotes economic stability and legal certainty. Economic regulations for economic development improve legal regulation and contribute to sustainable economic growth through various approaches¹. Legal certainty increases the confidence of businesses and investors and makes the economic environment more predictable. Most investors respond negatively to uncertainty and are more cautious². Legal frameworks should be developed to protect foreign investments and promote their growth within the framework of international investment agreements, which can contribute to economic growth. These agreements contain obligations that protect foreign investments from discriminatory behavior by host states³. Legal certainty is essential in the European Union (EU), where economic integration between Member States is vital. Effective, transparent, enforceable legislation creates a favorable investment environment in the national and EU economies. The single market and harmonized regulations within EU Member States facilitate the flow of capital investment, directly influencing GDP growth. Analyzing the regulatory environment helps to understand which rules in a given national economy encourage or hinder economic development.

Appropriate legal frameworks are also crucial for innovation and competitiveness, as they facilitate innovation and competitiveness in the national economy. At the (EU) level, innovation is crucial for progress and sustainable economic growth⁴. The protection of intellectual property, the regulation of businesses, and the support for research and development are all factors that contribute to economic growth, as reflected in GDP growth. There are significant differences between EU countries in these areas, so the impact of these differences on economic performance is an exciting research topic.

In conducting the research indicated in the study's title, more specific theoretical issues of the rule of law should also be addressed. Regarding the relationship between the rule of law and economic growth, I consider the following to be worth highlighting: The rule of law means a stable institutional

¹ Tóth, J. Z.: A historical outline of the concept of the Rule of Law/A jogállamiság fogalmának eszméletörténeti vázlata, *Diké Folyóirat*, 6(1) 2022, pp. 241-255.

² Kecsmár, K.: The concept of the rule of law in the case law of the Court of Justice of the European Union/A jogállamiság fogalma az Európai Unió Bíróságának ítélezési gyakorlatában, *Európai Tükör*, 23(2) 2020, pp. 31-51.

³ Wu, Z., Zhou, W., Yu, A.: Analysis of a legal regulation approach and strategy of a sharing economy based on technological change and sustainable development, *Sustainability*, 15(2) 2023, pp. 1056.

⁴ Qian, X., Ghaziani, M. A.: The Relationship between Transparency Obligations and Foreign Investment in Renewable Energies: Realising the Potential Role of IIAs, *Energies*, 17(11) 2024, pp. 2721.

and legal framework where equality before the law, the separation of powers, the independence of the courts, and a public administration free from corruption prevail. This has several components: corruption, judicial independence, the quality of regulation (the predictability of the business environment and laws), and institutional efficiency (the quality of the government bureaucracy). These factors are fundamental from a legal and political perspective and can also have a decisive impact on economic performance. A strong institutional system – significantly curbing corruption, ensuring freedom of speech, and enforcing the rule of law – reduces market uncertainty, improves the efficient allocation of resources, and thus positively affects the functioning of the economy. In short, the rule of law provides a solid foundation for long-term economic growth, while weak institutions and high levels of corruption can deter investors and distort markets.

Several empirical studies have examined the relationship between the rule of law and economic growth. International comparisons consistently show that countries with better institutional quality grow faster. For example, a World Bank study found that the protection of property rights, low corruption, and good bureaucratic quality significantly and positively impact economic growth. However, the relationship is not automatic: some analyses paint a more nuanced picture. For example, a panel analysis of data from 11 Central and Eastern European EU Member States between 2002 and 2018 found that while improvements in government efficiency accelerated GDP growth, changes in the World Bank’s “rule of law” indicator were not statistically significant for growth. This may suggest that certain institutional factors (such as the efficiency of public administration) directly affect the economy. However, the general rule of law indicator can only be used with other factors.

The components of the rule of law are closely linked to economic performance. Judicial independence and the efficient administration of justice are key to investor confidence. If businesses can trust that their contractual disputes will be resolved impartially and within a reasonable time by the courts, they are more likely to invest in a country. It is widely acknowledged that faster and more efficient court processes contribute statistically significantly to higher GDP per capita growth. Specifically, suppose a country reduces the length of litigation, reduces the backlog of pending cases, and improves the “clearance rate” of cases. In this case, this encourages private investment, improves business confidence, and ultimately supports GDP growth.

The rule of law in the European Union is generally higher than the world average – the EU is one of the best-governed regions in the world. However, there are significant differences in institutional quality between Member States. These differences are also reflected in other indicators of institutional

effectiveness. For example, according to the World Bank's global governance indicators, the "rule of law" indicator (on a scale from -2.5 to +2.5) in the Scandinavian countries is around ~1.8-2.0 (which is among the highest in the world), while in some newer Member States, such as Bulgaria or Hungary, it is around 0 (well below the EU average). Accordingly, a correlation can be observed between GDP per capita and rule of law indicators: countries with better institutional indicators (e.g., Sweden, the Netherlands, Germany) have higher income levels and more developed economies, while countries with weaker institutional indicators (e.g., South-Eastern Europe) have lower GDP per capita. However, it is essential to note that the rule of law does not only determine the economic growth rate. In addition to the above-mentioned aspects of the rule of law situation in EU Member States, additional questions can be examined, such as: How does the level of the rule of law influence the volume of foreign direct investment (FDI) in EU Member States? Is there a correlation between the quality of the rule of law and the efficiency of using EU funds? To what extent does the level of the rule of law in a given Member State influence the development of the business environment and innovation activity? How does the weakening of the rule of law affect social trust and the willingness of economic actors to cooperate? What relationship can be demonstrated between the level of rule of law within the EU and the quality of public policy decision-making? These are individually relevant questions, but answering and examining them would require writing a separate study.

The political stability of the examined national economy is essential for investors in terms of GDP production, where investors require political stability as an initial condition for considering these areas as investment targets⁵. When examining the relationship between economic growth and legal security, one cannot ignore the social cohesion experienced in the analyzed national economy. (Social cohesion means that society can ensure the well-being of its members, minimize inequalities, and avoid polarization). The rule of law and properly functioning institutions contribute to the EU's political stability and social cohesion, positively influencing economic growth. Maintaining and strengthening the rule of law is a central issue in the EU, and its constant examination is especially relevant in the later acceding Member States. The legal environment significantly determines the growth of a national economy. Several studies have established that the legal environment and government

⁵ Ahiadu, A. A, Abidoye, R. B, Yiu, T. W.: Decision-Making Amid Economic Uncertainty: Exploring the Key Considerations of Commercial Property Investors, *Buildings*, 14(10) 2024, pp. 3315.

management significantly promote sustainable economic development⁶. It is also essential to examine individual EU economies' legal environment and legislative quality for international comparisons and policy recommendations. This analysis allows for international comparisons and identifying best practices among EU Member States. This helps develop EU-level policy recommendations to promote EU economic growth and support the catching-up of lagging Member States.

This study adopts an interdisciplinary approach of law and economics, which allows it to comprehensively examine the relationships between the regulatory environment and economic performance in EU Member States.

The study examines the direction and strength of the relationship between economic growth (GDP production) and the regulatory environment in EU Member States between 2012 and 2022. The author analyzes how the legislative environment and the quality of legislation influence economic performance and to what extent they contribute to GDP growth. The Literature Review and Materials and Methodology sections follow the Introduction. The study concludes with the results, conclusions, and policy implications.

2. LITERATURE REVIEW

The EU is based on the rule of law and respect for individual rights and freedoms. These values are recorded at the beginning of the Treaty on the European Union (TEU). This treaty is the primary law that defines the purpose, democratic principles, institutions, and governance framework of the EU. According to Article 2 of the EUSZ, the Union is based on the values of respect for human dignity, freedom, democracy, equality, the rule of law, and respect for human rights, including the rights of persons belonging to minorities. EU Member States share these values in a society of pluralism, non-discrimination, tolerance, justice, solidarity, and equality between women and men. The Treaties have been accepted and ratified by all EU Member States. Member States (together with the EU institutions) are obliged to promote the EU's objectives and protect its values.

The following is a review of some of the literature on the relationship between the rule of law and economic growth. One study examined the issue of the rule of law. According to the research findings, the 2018 judgments of the European Court of Justice (Court of Justice of the European Union) place the

⁶ González Fernández, S, Kubus, R, Mascareñas Pérez-Iñigo, J.: Innovation ecosystems in the EU: policy evolution and horizon europe proposal case study (the Actors' perspective), *Sustainability*, 11(17) 2019, pp. 4735.

concept of the rule of law in the legal field for the sake of adequate protection and its protection. They focus on the issue of the independence of the judiciary. The significance of the judgments is unquestionable, but a general definition of the rule of law is yet to be established.⁷ There is extensive international literature examining the rule of law, some of which is presented in this study. The research results show that the economic impact of the rule of law on governmental sustainable economic management is insignificant. The rule of law can also be manifested in the spending of tax revenues and the involvement of social organizations, which positively affect the economy. This effect was only visible in the 2002–2019 time series but not in the 2007–2017 time series. Based on these results, the authors recommend that China strengthen the rule of law in its courts and prosecutors⁸.

Another piece of research aims to shed light on the relationship between EU Member States' implementation of energy policy objectives and loyalty to the rule of law. Establishing the relationship between the indicators of an environmentally sustainable energy policy and the commitment to the rule of law is still an uncharted area in the current literature⁹. A study examined the low sanctioning of violations of EU law. According to the article's results, antipathy towards increasing the EU's powers, ideological sympathy for illiberal governments, and fear of the spillover effects of sanctioning activities indicate the actions of governments within the Council. These three institutional logics explain the unexpectedly low number of sanctions for violations of EU values¹⁰. The rule of law is closely related to the concept of freedom of contract for economic actors. The main aspects of contractual freedom (freedom to conclude contracts, freedom to choose partners, freedom of type, freedom of content) ensure that the rules of contract law are easily adapted to social and economic changes. Several researchers have examined freedom of contract. The legal system must protect property rights and enforce contracts equally. Economic freedom, therefore, means the possibility of voluntary market exchange, and it has two elements at a general level: private property and free-

⁷ Kurecic, P., Kokotovic, F.: The relevance of political stability on FDI: A VAR analysis and ARDL models for selected small, developed, and instability threatened economies, *Economics*, 5(3) 2017, pp. 22.

⁸ Wei, F., Kong, Y.: Government governance, legal environment, and sustainable economic development, *Sustainability*, 6(4) 2014, pp. 2248–2263.

⁹ Xiao, W. et al.: The Influence of Rule of Law on Government's Sustainable Economic Management: Evidence from China, *Sustainability*, 15(15) 2023, pp. 11690.

¹⁰ Wisniewski, R., Nowakowska-Krystman, A., Kownacki, T., Daniluk, P.: The Impact of the Rule of Law on Energy Policy in European Union Member States, *Energies*, 17(3) 2024, pp. 739.

dom of contract. No business can operate without the freedom of contract, as it is not enough to recognize the profit opportunities offered; you must also be able to take advantage of them. However, taking advantage of the profit opportunities is only possible if the company can acquire the necessary production factors, which is only possible with a contract. One study compared consumer absentee contracts regulated within the European Union to the medieval Roman legal solution known as *negotium claudicans*, a contract with minors. This article builds on this comparison and applies it to a more recent EU directive that further pursues interference with the binding nature of contractual terms¹¹. The law of contracts is diverse, the most essential principle of which is necessarily the freedom of the contracting parties. Given that this contractual legal principle is based on the gentlemanly behavior typically observed in economic life, it is desirable to narrow down the legal regulation, as this way, the will of the parties can prevail more fully. Freedom of contract means that the will of the subjects forming the consensus is not legally binding. Freedom of contract is one of the fundamental principles of modern private law, the “accompanying phenomenon” of commodity ownership. Contract law offers a mechanism by which the parties can, to a certain extent, predict, control, and stabilize the future. In a free society, autonomous human existence can make a rational choice; people can freely enter mutually binding agreements¹². A study examined the universal nature of legal analogy. As a result, the study refutes the universal nature of legal analogy as a method of overcoming legal gaps in the field under study. At the same time, analogy’s active and positive role can be seen as part of other interpretation methods of ambiguous contractual provisions, such as literal interpretation, a combination of textual and contextual interpretations, and its appeal to tradition¹³. One study examined the unfairness of contracts in the context of freedom of contract. The topicality of the topic is because some of the Hungarian cases brought before the Court of Justice of the European Union in connection with the unfairness of the general contract terms refer to whether the requirement of precise wording can be expanded so much that it also includes those profession-specific stipulations, which are therefore considered unfair to qualify¹⁴. Investigating the perception of truth related to the conclusion of a contract is a study which explored the

¹¹ Closa, C.: Institutional logics and the EU’s limited sanctioning capacity under Article 7 TEU, *International Political Science Review*, 42(4) 2020, pp. 501-515.

¹² Török, É.: The role of freedom of contract in regulating the economy/A szerződési szabadság gazdaságsszabályozó szerepe, *Debreceni Jogi Műhely*, 11(1-2) 2014.

¹³ Blicharz, G. J.: Consumers as unassisted minors: asymmetrical sanction for unfair contract terms, *Laws*, 11(6) 2022, pp. 87.

¹⁴ Török, É.: Possible aspects of the interpretation of freedom of contract/A szerződési szabadság értelmezésének lehetséges aspektusai, *Jogtudományi Közlemény*, (1) 2012, pp. 40-45.

role of continuous trust and fairness perceptions in the relationship between contractual flexibility and the entrepreneur's cooperative behavior and aimed to investigate possible influence pathways further. The authors found the following: (1) In addition to perceptions of justice, ongoing trust is another crucial mediating factor in the relationship. (2) Together with the former, continuous trust exerts significantly multiple mediating effects and represents the main indirect influence paths, among which the parallel is the strongest and the chain is the third. (3) both factors are more likely to be affected by flexibility in contract execution than in contract content¹⁵.

One of the essential elements of the legal environment of a given national economy is the application of fair contracts. In this study, the author states that unfair agreements often contain terms that are more favorable to the trader but unfair to the consumer. Since then, consumers have become a vulnerable group against contract terms¹⁶¹⁷.

Many researchers have investigated the relationship between economic growth and various macroeconomic variables; there is a vast amount of literature on this topic. One study examined the impact of the degree of digitalization¹⁸, and another examined the consequences of digital development on economic growth. Two additional studies, the first on robotization¹⁹ and the second on the impact of energy consumption on economic growth, are presented²⁰.

Several studies have analyzed the state of the rule of law in the EU. The following section presents some of the articles dealing with this topic.

¹⁵ Mikryukov, V. A.: Legal Analogy in the Cases of Overcoming a Contract's Verbal and Numerical Ambiguity. *Laws*, 11(5) 2022, pp. 76.

¹⁶ Török, É.: Application of law relating to consumer contracts/A fogyasztói szerződésekkel kapcsolatos jogalkalmazás, <<https://dea.lib.unideb.hu/server/api/core/bitstreams/cc78658c-93e0-401a-a821-21d884435c42/content>>, last accessed on 18/07/2024.

¹⁷ Török, É.: Practical Problems in the Field of Consumer Contract, *Proceedings of 127th The IRES International Conference* (pp. 60-63), Barcelona, 2018. <https://www.worldresearchlibrary.org/up_proc/pdf/1778-153563057960-63.pdf>, last accessed on 18/10/2024.

¹⁸ Török, L.: The relationship between digital development and economic growth in the European Union, *International Review of Applied Sciences and Engineering*, 15(3) 2024, pp. 375-389.

¹⁹ Török, L.: The importance of digitalization and robotization in vehicle production in the European Union, *International Review of Applied Sciences and Engineering*, 14(1) 2023, pp. 125-131.

²⁰ Bánai, O.: The European Union regulation concerning the energy consumption of buildings - an ecological point of view, *International Review of Applied Sciences and Engineering*, 4(2) 2013, pp. 111-116.

A study examines the EU's means of addressing rule of law violations in its Member States. Another study examines the EU's means of addressing rule of law breaches in Member States. It discusses the effectiveness of the EU rule of law framework and its challenges. As part of its broader strategy, the Commission announced the establishment of an annual rule of law review cycle, which will monitor developments in the rule of law in all EU Member States²¹. Another study examines the erosion of the EU's core rule of law values. The article concludes that the EU's decade-long rule of law crisis has become a normalized constitutional and political experience. Without respect for the EU's core rule of law values, differentiated governance as a set of political or legal practices has no purpose or end²². A study concludes that the measures provided for in the Treaties are not sufficient to effectively counter risks or breaches of the rule of law that may occur in Member States. A regulation has been adopted, which, in general terms, can be said to allow the activation of a system that blocks access to EU funds. The purpose of the blocking is to protect the financial interests of the Union from the risk of financial loss in the event of deficiencies in the rule of law²³. According to a study, it should start preparing amendments to Article 7 of the Treaty on European Union, which contains a sanctions mechanism, and the European Commission's rule of law framework to strengthen the EU's internal protection to uphold the rule of law²⁴.

3. MATERIAL AND METHOD

Society needs numerical data to test political and economic relationships (this is especially important for economists), and a properly developed index can provide the basis for such calculations. GDP is widely known as an indicator of the performance of the national economy, and this study will not discuss it in more detail (Table 1)²⁵. The difficulty arises because researchers want to measure phenomena that cannot be observed directly (such as the subject of this study, the rule of law). However, there are methods established in sta-

²¹ Blauburger, M., van Hüllen, V.: Conditionality of EU funds: an instrument to enforce EU fundamental values?, *Journal of European Integration*, 43(1) 2020, pp. 1-16.

²² Uitz, R.: The Rule of Law in the EU: Crisis, Differentiation, Conditionality, *European Papers*, 7(2) 2022, pp. 929-948.

²³ Bachmaier, L.: Compliance with the Rule of Law in the EU and the protection of the Union's Budget, *Eucrim: the European Criminal Law Associations' forum*, (2) 2019, pp. 120-126.

²⁴ Niklewicz, K.: Safeguarding the rule of law within the EU: lessons from the Polish experience, *European View*, 16(2) 2017, pp. 281-291.

²⁵ Eurostat: GDP and main components (output, expenditure, and income), Current prices, million euro (2014-2023), 2024, <https://ec.europa.eu/eurostat/databrowser/view/nama_10_gdp/default/table?lang=en>, last accessed on 18/07/2024.

tistics to deal with such situations. These will be discussed specifically in the following section. The methodological part of this study primarily deals with the index used to measure the rule of law. Several indices exist in the literature on legal systems/rule of law. One explanation for the existence of indices is that a single indicator can provide information on complex issues (such as the rule of law) in a much simpler way, thus providing information that is easier for non-experts to interpret²⁶. Generally, the methodology for compiling indicators should be transparent, and methodological decisions should be well-justified. It is relevant that without transparency and a justified methodology, the usefulness of compiling indices is minimal, as they may raise doubts in public opinion without them. Table 2 of the study will use data from the World Bank “Worldwide Governance Indicators” (WGI) to measure the rule of law. The WGI index combines six governance dimensions into an aggregate indicator, one of which is the rule of law (ROL).

The Eurostat provides the primary GDP data for the analysis database.

Table 1. GDP data of EU Member States, in billions of euros (2012-2022)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	22/12
BE	386	393	403	417	430	445	460	479	461	508	554	144
BG	42	42	43	46	49	53	56	62	62	71	86	205
CZ	164	160	159	171	179	197	214	229	220	246	287	175
DK	254	260	266	272	282	294	301	309	312	345	382	150
DE	2745	2811	2927	3026	3135	3267	3365	3474	3404	3617	3877	141
EE	18	19	20	21	22	24	26	28	27	31	36	200
IE	177	183	201	273	276	309	335	364	382	449	521	294
EL	188	180	177	176	174	177	180	183	165	182	207	110
ES	1031	1021	1033	1078	1114	1162	1204	1246	1119	1222	1346	131
FR	2088	2120	2154	2201	2232	2292	2355	2432	2318	2508	2655	127
HR	45	45	44	45	48	50	53	56	51	59	68	151
IT	1624	1613	1627	1655	1696	1737	1771	1797	1661	1822	1963	121
CY	19	18	17	18	19	20	22	23	22	25	28	147
LV	22	23	24	25	25	27	29	31	30	33	38	173
LT	33	35	37	37	39	42	46	49	50	56	67	203
LU	47	49	52	54	56	58	60	62	65	72	78	166
HU	100	102	106	113	116	127	136	147	138	154	169	169
MT	7	8	9	10	11	12	13	14	13	15	17	243
NL	658	666	672	690	708	738	774	813	797	871	959	146

²⁶ Kaufmann, D., Kraay, A., Mastruzzi, M.: The World Governance Indicators: Methodology and Analytical Issues, *The Hague Journal on the Rule of Law*, 3(2) 2011, pp. 220-246.

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	22/12
AT	319	328	333	344	358	369	385	397	381	405	447	140
PL	385	388	406	430	425	466	499	532	526	576	656	170
PT	168	170	173	180	186	196	205	214	201	216	242	144
RO	139	143	151	160	167	186	206	224	220	242	284	204
SI	36	36	38	39	40	43	46	49	47	52	57	158
SK	74	74	76	80	81	85	90	94	93	100	110	149
FI	201	204	207	211	218	226	233	240	238	251	268	133
SE	428	440	436	452	465	476	467	475	479	539	552	129
EU	8927	11531	11791	12224	12651	13078	13531	14023	14482	14667	15954	179

The data in Table 1 show a positive growth trend. It is clear from the data that the EU's GDP grew continuously during this period, at a rate of 79 percent. This growth is due to various factors, including economic stability, increasing productivity, trade expansion, internal market integration, and innovation.

The increase in the EU's economic performance suggests that the region has been able to cope with global and internal challenges, including economic downturns and political uncertainties.

Ireland, Malta, Bulgaria, Romania, and Estonia achieved the most dynamic GDP growth in that order. The GDP of Spain, Sweden, France, Italy, and Greece increased the least in the EU during the examined period.

The World Bank database provides the values of the Rule of Law (ROL) indicator for the analysis²⁷. The ROL indicator focuses on areas such as general respect for the law in society, compliance with contracts and protection of property rights, efficiency, independence, and fairness of the judiciary, the incidence of violent crime, street crime, and illegal activities, and safety of citizens and businesses under the law.

The percentile-based analysis allows for comparison of EU Member States in the context of a global ranking, showing where a given country ranks compared to all countries in the world. On a scale of 0-100, higher percentile values indicate a better rule of law, i.e., the country is at the top of the global ranking. The analysis over time (2012-2022) helps to reveal changes in the relative position of Member States, such as improvements or deteriorations in the rule of law. This assessment is particularly important in the EU, where the rule of law is one of its core values and differences between countries are relevant for political and economic integration.

²⁷ World Bank: Worldwide Governance Indicators, <<https://www.worldbank.org/en/publication/worldwide-governance-indicators/interactive-data-access>>, last accessed on 18/07/2024.

Table 2. Evolution of ROL indicator values in EU Member States (2012-2022)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	22/12
BE	90.1	90.1	88.9	88.1	88.6	87.6	87.6	87.6	87.6	87.6	88.2	88.4
BG	51.6	50.7	54.3	51.4	49.5	50.9	51.0	52.4	49.1	52.4	49.5	51.2
CZ	81.2	81.7	84.6	83.3	81.4	82.9	81.9	81.9	82.9	83.3	83.5	82.6
DK	98.1	98.6	99.5	99.5	97.6	97.6	96.7	97.1	98.1	98.1	99.5	98.2
DE	92.0	92.0	93.8	93.8	93.3	91.4	91.4	92.4	91.0	91.4	92.0	92.2
EE	85.9	86.4	87.0	87.1	85.7	85.7	85.7	86.2	88.6	88.1	89.6	86.9
IE	94.4	94.8	92.8	92.9	89.1	88.1	88.6	88.1	89.5	90.5	91.5	90.9
EL	63.9	64.8	66.4	62.9	57.6	55.2	57.1	57.6	60.0	60.5	60.0	60.5
ES	83.1	82.2	80.3	78.1	80.5	81.9	80.5	81.0	76.7	77.6	77.4	79.9
FR	90.0	89.2	88.5	87.6	87.6	88.6	88.1	88.6	87.1	87.1	88.4	88.3
HR	59.2	58.2	63.5	60.5	62.4	61.4	61.9	61.9	59.1	58.6	61.3	60.7
IT	64.3	63.9	67.8	63.3	62.9	62.4	60.0	60.5	57.6	58.1	58.5	61.8
CY	84.0	82.6	82.7	81.0	74.8	78.1	75.2	75.2	68.1	71.0	68.9	76.5
LV	71.8	72.3	77.9	75.2	79.1	78.6	78.1	80.0	79.5	81.2	79.7	77.6
LT	71.2	72.3	77.9	75.2	79.1	78.6	78.1	80.0	79.9	81.9	79.7	77.6
LU	96.2	96.7	95.7	96.7	95.2	95.2	96.2	96.2	95.7	96.7	98.6	96.3
HU	68.1	67.6	70.7	65.2	65.2	69.0	70.5	68.6	67.9	67.6	63.2	67.6
MT	87.8	87.8	86.1	82.9	81.0	84.3	81.4	79.1	78.1	77.1	76.4	82.0
NL	97.2	97.2	97.1	97.1	97.1	95.7	95.7	95.7	94.8	94.8	93.4	96.0
AT	97.7	97.7	97.7	96.2	97.1	98.6	98.6	98.6	97.1	97.1	95.8	97.5
PL	73.2	74.2	78.4	76.2	71.4	64.3	63.8	63.3	67.6	64.3	64.2	69.2
PT	82.6	83.1	82.4	82.9	83.3	84.3	83.8	83.8	85.2	84.3	84.1	83.6
RO	57.7	58.7	64.9	61.4	67.1	67.1	63.3	63.8	62.9	62.4	62.3	62.9
SI	80.8	81.2	80.8	80.0	84.3	81.4	82.4	82.9	83.3	82.4	82.6	82.0
SK	64.8	64.3	69.2	67.6	71.2	68.6	68.6	69.1	73.8	72.9	70.3	69.1
FI	99.5	99.5	100	100	100	100	100	100	100	100	100	99.9
SE	99.1	99.1	97.6	99.1	99.1	98.1	97.1	96.7	96.7	95.2	93.9	97.4
EU	80.9	81.0	82.5	80.9	80.8	80.6	80.1	80.3	80.0	80.0	79.7	99.0

Table 2 shows the values of the ROL²⁸ index of EU Member States for 2012-2022. The indicator quantifies the exam and its four pillars: the justice system, the anti-corruption framework, media pluralism, and other institutional parameters related to checks and balances. ROL Index is a quantitative assessment tool showing how countries practice the rule of law. The higher the value of the index, the higher the level of the rule of law.

²⁸ The World Bank defines the rule of law as the extent to which citizens trust and abide by the rules of society. Of particular relevance are the quality of contract enforcement, the protection of property rights, the effectiveness of police and courts in law enforcement, and the likelihood of crime and violence being detected.

The ROL indicator measures the state and quality of the rule of law in a given country. This includes the level of the rule of law, government efficiency, judiciary independence, and human rights protection. Higher values indicate a strong rule of law, a stable legal framework, and efficient justice, while lower values indicate a weaker rule of law.

The average value of the EU ROL indicator decreased from 80.9 to 76.4 between 2012 and 2022. This decrease indicates a general deterioration of the rule of law situation in the EU during this period. The decline can be attributed to several factors, such as the decrease in the independence of the courts, the weakening of the fight against corruption, or the deterioration of media pluralism and freedom. In the following, a correlation calculation is made with the GDP and ROL data of the EU Member States between 2012 and 2022 to determine the strength of the relationship between the two variables.

The value of the correlation coefficient shows the extent to which the level of the rule of law is related to economic performance in the EU Member States between 2012 and 2022 and can help identify areas where improving the legal environment can contribute to GDP growth.

In this study, a regression analysis following the Pearson correlation analysis was conducted with the aim to test the first study's results.

In the study, the author takes into account that economic growth is a complex phenomenon. Therefore, based on the neoclassical Solow model, the author makes GDP growth fundamentally dependent on the following four independent variables: Gross investment rate as a percentage of GDP, data: 1/ Gross fixed capital formation (investments, in million euro)²⁹; Population change - Demographic balance and crude rates at national level (person) ³⁰; Gross domestic R&D expenditure as a percentage of GDP, data: 3/ Gross domestic expenditure on R&D, Percentage of gross domestic product (GDP)³¹; Rule of Law index used earlier in the study, data: 4/ Worldwide Governance Indicators.

The analysis is carried out using a panel regression procedure.

²⁹ Eurostat: Gross domestic expenditure on R&D by sector, Percentage of gross domestic product (GDP), 2024, <https://ec.europa.eu/eurostat/databrowser/view/sdg_09_10/default/table?lang=en>, last accessed on 22/03/2025

³⁰ Eurostat: Population change - Demographic balance and crude rates at national level, 2024, <https://ec.europa.eu/eurostat/databrowser/view/DEMO_GIND__custom_2733962/bookmark/table?lang=en&bookmarkId=7084ed24-6b91-4cf3-b90d-d47565593505>, last accessed on 22/03/2025.

³¹ Eurostat: Gross domestic expenditure on R&D by sector, Percentage of gross domestic product (GDP), 2024, <https://ec.europa.eu/eurostat/databrowser/view/sdg_09_10/default/table?lang=en>, last accessed on 22/03/2025.

4. RESULTS

4.1. CLOSENESS OF THE RELATIONSHIP BETWEEN GDP AND ROL VARIABLES

Examining the strength of the relationship between GDP and ROL variables in the EU can help us understand how economic performance influences the state of the rule of law and vice versa.

A correlation coefficient was calculated to measure the closeness of the relationship between the two variables (GDP, ROL). The values of the Pearson correlation per member country, in the order of the countries in the table, are as follows: BE (-0.6480); BG (-0.3099); CZ (0.3243); DK (0.0404); DE (-0.8168); EE (0.7225); IE (-0.5229); EL (0.1817); ES (-0.5480); FR (-0.2051); HR (0.0060); IT (-0.6624); CY (-0.7995); LV (0.7252); LT (0.7150); LU(0.5430); HU (-0.3054); MT (-0.9451); NL (-0.9567); AT (-0.2556); PL (-0.7721); PT (0.6806); RO (0.1990); SI (0.4560); SK (0.6450); FI (-0.5694); SE (-0.8845).

Data of the test performed to prove the normal distribution:

P-value: 0.01673, W: 0.9042, Sample size (n): 27, Average (\bar{x}): -0.1468, Median: -0.2556, Sample Standard Deviation (S): 0.5911, Sum of Squares: 9.0857, b: 2.8663, Skewness: 0.2071

Figure 1. Normal distribution of correlation values between GDP and ROL variables

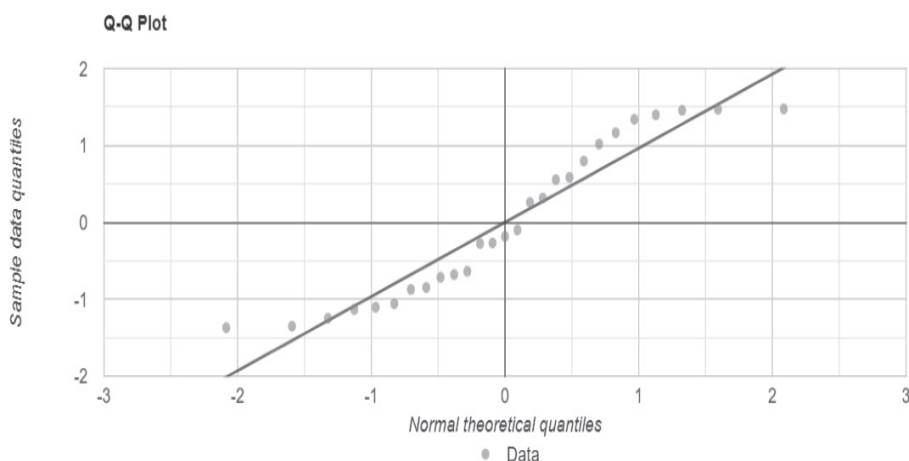


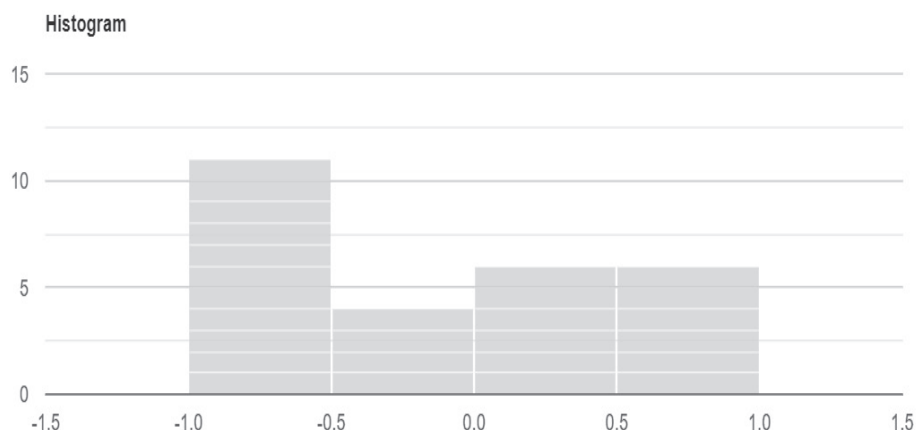
Figure 1 illustrates that the normal distribution is a probability function that shows how the values of a variable are distributed. A normal distribution is an

arrangement of data from a given population where most values are concentrated in the middle of the range. The further a value is from the center of the range, the fewer cases it has.

4.2. CLUSTERS CREATED BASED ON CORRELATION VALUES BETWEEN GDP AND ROL VARIABLES

Clusters created based on the correlation values between the GDP and ROL variables help to group the economic and rule of law situation of EU Member States. These clusters allow for comparisons between Member States and identify countries where economic development and the rule of law are stronger or weaker.

Figure 2. Clusters formed based on Pearson correlation values



The purpose of cluster analysis is to reveal and form relatively homogeneous subsets and groups based on the characteristics of relatively heterogeneous objects (countries, regions, etc.). An essential feature from the point of view of practical use is that it reveals the structures by simultaneously taking into account the identity criteria, i.e., it is not necessary to define the groups in advance. Figure 2 illustrates the four clusters formed according to the correlation coefficients.

Cluster 1, interval: -1.0; -0.5. Cluster countries: Netherlands, Malta, Sweden, Germany, Cyprus, Poland, Belgium, Italy, Spain, Finland and Spain. The correlation coefficient values between -1.0 and -0.5 indicate that in these countries, there is a robust negative relationship between the rule of law and the change in GDP. As the rule of law indicator increases, GDP decreases, or vice

versa. This type of negative correlation is uncommon and can be caused by various factors. The negative correlation in this cluster suggests that the relationship between the strengthening of the rule of law and economic performance is complex and depends on several factors in the EU. While the rule of law can positively impact GDP in the long term, challenges and adverse effects can also appear in the short term, mainly due to the transformation of the economic structure or changes in the regulatory environment.

Cluster 2, interval: -0.5-0.00. Cluster countries: Hungary, Bulgaria, France, and Austria. The correlation coefficient for these countries shows a slight negative correlation between GDP and the rule of law. This means GDP decreases slightly when the rule of law indicator increases, or vice versa. In countries such as Hungary and Bulgaria, where the judicial system and institutional framework are being transformed, improving the rule of law may involve short-term economic challenges, such as adjusting the financial structure or stricter action against corruption. In France and Austria, a decline in economic performance, such as during global economic shocks or recessions, may accompany changes in the rule of law. In such situations, strengthening the rule of law is not always accompanied by immediate economic improvement.

Cluster 3, interval: 0.0-0.5. Cluster countries: Denmark, Greece, Croatia, Romania, Slovenia, and the Czech Republic. In the countries belonging to this cluster, a weak positive correlation can be observed between GDP and the rule of law. This means that, in general, although not always to a significant extent, with the increase in the rule of law indicator, the GDP also increased in the examined period. In the cluster countries, especially Romania and Croatia, improving the justice system and institutional reforms may have contributed to economic stabilization and GDP growth. In the case of Denmark, Slovenia, and the Czech Republic, the stable rule of law environment benefits the investment climate. In such countries, the transparency of legislation and the efficiency of court systems can make the country more attractive to foreign and domestic investors, contributing to GDP growth. In the case of Greece, the strengthening of the rule of law and the structural funds available through EU membership contributed to the economic catch-up; despite this, this member country had the lowest GDP growth within the EU.

Cluster 4, interval: 0.5-1.0. Cluster countries: Slovakia, Portugal, Luxembourg, Latvia, Lithuania and Estonia. The fourth cluster includes countries where the correlation coefficient between GDP and ROL was 0.5 and 1.0, indicating a strong positive relationship between the two variables. This means that a significant increase in GDP can be observed parallel to the growth of the rule of law indicator. Such a robust positive relationship reflects several essential factors. In the case of Luxembourg and Estonia, a stable and transparent le-

gal environment promotes economic growth. Transparent legal frameworks and effective law enforcement increase GDP production. In the case of Latvia, Lithuania, and Slovakia, the institutional development associated with EU integration, including strengthening the rule of law, directly contributed to economic growth. Portugal and the Baltic states, especially Estonia, implemented significant reforms in the financial and legal spheres during the period under review. In the long run, such reforms strengthen the economic structure and increase economic competitiveness, reflected in GDP growth.

4.3. RESULTS OF REGRESSION TEST

The regression analysis was performed based on the data in Tables 1 and 2. Regression provides a deeper analysis. While Pearson correlation shows a simple linear relationship between GDP and ROL, regression analysis reveals the direction and magnitude of the effect of ROL on GDP, which provides a deeper understanding of the nature of the relationship between the variables. Regression allowed us to examine the effect of ROL on GDP separately for each country, highlighting the heterogeneity of the relationship and country-specific differences. The coefficients and R^2 values obtained during regression provide additional information on the extent and efficiency with which ROL explains GDP, while correlation only focuses on the strength and direction.

Table 3. Regression calculation and cluster classification results

COUNTRY	ROL_COEFFICIENT	R_SQUARED	CLUSTER
BE	-34.8421	0.4333	4
BG	-2.8670	0.0998	4
CZ	8.4946	0.0475	4
DK	1.3053	0.0010	4
DE	-149.8420	0.1796	3
EE	2.8499	0.4703	4
IE	-22.9746	0.2705	4
EL	0.1418	0.0023	4
ES	-21.6192	0.2030	4
FR	-82.1925	0.1741	3
HR	0.0506	0.0001	4
IT	-23.1305	0.4514	4
CY	-0.4922	0.6792	4
LV	1.1478	0.5486	4
LT	2.2236	0.5227	4
LU	5.4577	0.2949	4

COUNTRY	ROL_COEFFICIENT	R_SQUARED	CLUSTER
HU	-2.9501	0.0874	4
MT	-0.6936	0.8713	4
NL	-71.5721	0.9205	3
AT	-10.4193	0.0646	4
PL	-11.7746	0.5972	4
PT	18.6777	0.4707	1
RO	3.0948	0.0390	4
SI	2.7407	0.2575	4
SK	2.5362	0.4160	4
FI	59.8888	0.3241	1
SE	-20.2654	0.7927	4
EU	-1626.7836	0.4309	-

Table 3 shows the results of the regression calculation; the main data are as follows: R^2 (R-squared): 0.002. This indicates that the ROL variable hardly explains the variance of GDP.

ROL coefficient: 8.9961. An increase in the ROL index by 1 unit is associated with an average increase of 8.996 units in GDP, but this result is insignificant (p-value: 0.388). Constant: 206.8164; this is the average GDP value if the ROL value were 0. P-value: 0.388. The high p-value indicates that there is no statistically significant relationship between ROL and GDP.

Cluster characteristics:

Cluster 1: Countries in cluster 1: Portugal (PT), Finland (FI). For these countries, the effect of ROL on GDP (ROL coefficient) is 39.28 on average, while the average R^2 values are 0.40. This cluster mainly contains countries where the relationship is moderately strong.

Cluster 2: The country in cluster 2: Aggregate data for the European Union (EU). Here, the ROL effect on GDP (ROL coefficient) is, on average, -1626.78, while the average R^2 values are 0.43. This cluster stands out due to its outliers, probably due to its aggregated nature.

Cluster 3: The countries in Cluster 3 are Germany (DE), France (FR), and the Netherlands (NL). For these countries, the ROL effect on GDP (ROL coefficient) is, on average, -101.20, while the average R^2 values are 0.42. This cluster contains developed economies where the relationship is relatively weak.

Cluster 4: Countries in cluster 4 are Belgium (BE), Bulgaria (BG), Czech Republic (CZ), Denmark (DK), Estonia (EE), Ireland (IE), Greece (EL), Spain (ES), Croatia (HR), Italy (IT), Cyprus (CY), Latvia (LV), Lithuania (LT), Luxembourg (LU), Hungary (HU), Malta (MT), Austria (AT), Poland (PL), Romania (RO), Slovenia

(SI), Slovakia (SK), Sweden (SE). For these countries, the ROL effect on GDP (ROL coefficient) is, on average, -5.54, while the average R^2 values are 0.33. This is the largest cluster, containing diverse countries with weak correlations.

To summarize the regression relationship between GDP and ROL, the following can be stated: Based on the regression analysis and clustering, the relationship between GDP and ROL is generally weak in EU countries. The low R^2 values (usually between 0.33 and 0.43) indicate that ROL explains only a small amount of GDP variance in most countries. The regression analyses by country have shown that ROL's effect (coefficient) varies greatly: in some countries, it is positive; in others, it is negative. This heterogeneity suggests that other factors, such as economic development, institutional environment, or regional characteristics, may strongly influence the relationship. Based on the results, the relationship cannot be considered robust. Although a moderate effect is observed in specific clusters (e.g., Finland and Portugal's case), in most countries, the impact of the ROL variable on GDP is not statistically significant.

4.3. RESULTS BASED ON THE SOLOW MODEL

The results of the final panel regression of the Solow model are presented in detail below and their economic interpretation is described.

Table 3. Main variables of the Solow model and their effects

Variable	Coefficient	Statistical significance	Economic interpretation
Investment	+0.0033	Highly significant ($p < 0.001$)	The growth in investments contributes to GDP growth in a small but stable way.
Population_Growth	-1501.49	Highly significant ($p < 0.001$)	Negative impact: rapid population growth does not necessarily lead to GDP growth, and in fact, it can have a negative impact if the labor market and infrastructure do not develop properly.
R&D expenditure	+2029.71	Highly significant ($p < 0.001$)	Strong positive impact: investment in innovation significantly increases GDP, which reinforces the role of technological progress in economic growth.
Rule of Law)	-31.15	Highly significant ($p < 0.001$)	Negative impact

Source: own calculation

According to the analyses in Table 3, the investment rate (Investment) and R&D expenditure (R&D) contribute significantly and positively to the GDP growth of EU Member States, which confirms that capital accumulation and technological development play a key role in improving economic performance.

Population growth (Population_Growth) had a negative effect on GDP, which suggests that an expanding workforce alone is not sufficient for sustainable economic growth and that appropriate institutional and infrastructural developments are also necessary in EU Member States.

The rule of law index (Rule of Law) received a negative coefficient, indicating that excessive regulation and administrative burdens may reduce economic growth in some Member States, especially where the financial structure is less adaptable.

Clustering according to Solow model analysis

For countries showing similar economic patterns, based on panel data and regression results, the EU Member States were classified into clusters based on the main drivers of GDP growth.

Table 4. Clusters according to the main drivers of GDP growth

Cluster	Countries	Main characteristics
R&D and investment-driven growth	Germany, France, Netherlands, Sweden, Ireland, Finland, Austria, Belgium, Luxembourg	High GDP, strong R&D impact, stable rule of law, investment-oriented growth.
Population-led growth	Poland, Romania, Hungary, Czech Republic, Portugal, Slovenia, Estonia	Moderate GDP growth, workforce expansion is decisive, R&D has a smaller impact.
Countries sensitive to rule of law impact	Greece, Bulgaria, Croatia, Slovakia, Italy, Spain, Cyprus, Latvia, Lithuania, Malta, Slovenia	Changes in the rule of law significantly affect growth, unstable institutional effects.

Source: own editing

According to Table 4, clustering helps to understand the growth paths and different economic strategies of the EU Member States.

The most striking difference between the clusters is that the countries in the first group grew based on technological progress and investments, the second on demographic potential, and the third on institutional factors.

Analyzing the effect of the rule of law, the regression results show that the Rule of Law index has a negative impact, which shows that the effect is not linear (above a certain level, it can affect the economy of EU Member States differently). The interaction of ROL with R&D and investments is positive, meaning that a stable legal environment helps high-technology and investment-intensive countries. Eastern and Western Europe react differently to the rule of law – while in more developed countries, regulatory rigor can be beneficial. Elsewhere, it can appear as an inhibitory effect due to administrative burdens.

The extended panel regression model – which examined GDP development as a function of the investment rate, population growth, R&D expenditure, and the rule of law index – leads to different results than the previous project, which interpreted only the bivariate relationship between GDP and ROL. Based on the current multivariate model, the effect of ROL is statistically significant in several Member States, where institutional stability and administrative efficiency indirectly influence the volume of investments or the return on R&D expenditure. This means that although the rule of law alone did not robustly determine GDP growth, it already appears as a relevant factor together with other factors (in interaction). The extended model, therefore, reveals a more complex relationship and does not confirm the finding of the previous project: the role of the rule of law is exerted through sectoral or structural mediating variables, which was previously hidden in the bivariate analysis.

5. CONCLUSION AND PUBLIC POLICY IMPLICATIONS

Analyzing the relationship between the rule of law and economic indicators of the EU Member States carries important public policy lessons. Strengthening the rule of law and establishing transparent legal frameworks support economic growth, institutional stability, and social well-being. It is essential for EU Member States' decision-makers to understand that the relationship between strengthening the rule of law and economic growth is not always linear. Countries such as Estonia and Luxembourg provide examples of how legal stability and transparency can support economic growth. The role of the EU institutions can be crucial in supporting rule of law reforms, especially in countries where the implementation of reforms faces challenges. Greece, Romania, Slovenia, the Czech Republic, Hungary, and Bulgaria showed a weak relationship between the rule of law and GDP. This suggests that although strengthening the rule of law generally positively affects the economy, the extent of the impact and the economic benefits achieved may vary.

The study also analyzed the closeness of the relationship between economic output and the rule of law using correlation analysis and regression analysis.

The study concludes that it cannot be stated with complete certainty that there is a robust and linear relationship between GDP production and the level of the rule of law. This means that in EU Member States with a high level of the rule of law, economic growth is more dynamic, and vice versa: economic growth is lower in member countries with a lower rule of law. The results of the clustering show that the economic development of a selected member country is also essential. Several EU Member States had low economic development at the beginning of this study. Still, during the period under review, they produced more dynamic GDP growth than some more developed Member States.

According to the results of the new multivariate model, the effect of the ROL index is statistically significant in several EU Member States, especially in those where institutional stability and administrative capacity indirectly influence investment activity and the efficiency of R&D spending. This suggests that although the rule of law alone did not show a strong and consistent relationship with GDP growth, it plays an essential role in the development of economic performance in EU Member States when combined with other financial factors.

Based on the results, the study formulates two policy recommendations: first, the EU should consider that although the direct impact of the rule of law (ROL) on GDP is not strong, maintaining the rule of law is essential for long-term economic stability and investment; second, the relationship between ROL and GDP is heterogeneous, and the EU is therefore recommended to develop country-specific policies that take into account the economic structure and institutional characteristics of individual Member States.

ABBREVIATIONS

The European Union (EU) consists of 27 countries: Sweden (SE), Spain (ES), Slovenia (SI), Slovakia (SK), Romania (RO), Portugal (PT), Poland (PL), the Netherlands (NL), Malta (MT), Luxemburg (LU), Lithuania (LT), Latvia (LV), Italy (IT), Ireland (IE), Hungary (HU), Greece (EL), Germany (DE), France (FR), Finland (FI), Estonia (EE), Denmark (DK), the Czech Republic (CZ), Cyprus (CY), Croatia (HR), Bulgaria (BG), Belgium (BE), and Austria (AT).

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