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THE IMPACT OF FORMAL AND INFORMAL INSTITUTIONS ON ECONOMIC GROWTH: A PANEL DATA ANALYSIS[1]

Summary

Purpose | The purpose of the article is to assess the impact of institutions on economic performance using the example of a broad set of economies over the period 1990–2020.

Research method | The article uses both critical literature review and empirical analysis. The empirical analysis uses quantitative methods, more specifically panel data modeling.

Results | The obtained research results do not differ from previous findings. Specifically, a higher-quality institutional system leads to a higher rate of economic growth. The study found that the impact of changes in formal institutions will vary depending on the quality of informal institutions. When informal institutions are of higher quality, improving formal institutions will lead to better outcomes than when informal institutions are of lower quality. Therefore, it can be concluded that formal and informal institutions can mutually reinforce each other, leading to higher rates of economic growth. On the other hand, formal and informal institutions may be incompatible, leading to lower rates of economic growth.

Originality/value/implications/recommendations | The issue of the impact of institutions on economic growth has been discussed in the literature for some time. However, attempts to empirically verify the impact of the interactions between formal and informal institutions on the rate of economic growth have rarely been undertaken. A strength of this article regards its consideration of this interaction and its estimation of its impact on the rate of economic growth.

Keywords: institutions, economic growth, dynamic panel model

JEL classification: O11, O43, C23

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1. Introduction

Economists are constantly searching for answers to the question: Why do some countries grow faster and others slower? What causes certain economies to be able to achieve sustained high growth rates, while some are still unable to do so? Despite the passage of many years, we still do not know the answer to such a question. Representatives of development economics make various attempts, but the results are still not satisfactory. The discovery of the Solow model [Solow, 1956, pp. 66–68], which explains income differences through differences in technology, differences in physical capital and differences in human capital, was a breakthrough moment. However, the assumption that these are exogenous factors is problematic. Only in endogenous models has technology been treated as an endogenous variable [Romer, 1986, pp. 1014–1027; Romer, 1990, pp. 78–98; Barro and Sala-i-Martin, 1997, pp. 2–12; Barro and Sala-i-Martin, 2004, pp. 205–380; Lucas, 1988, pp. 3–42]. However, these differences in technology, in physical capital or in human capital can only be identified as the proximate causes of economic growth. Another question must be asked, namely: Where do these disparities in technology, in physical capital or in human capital come from? One possible reason for these disparities is geography. Geography can be the determinant of climate, of natural resources or of disease burden. Climate can affect productivity and attitudes in a society. Natural resources, or lack thereof, translate into wealth or the process of industrialisation. In addition, topography can affect the cost of transportation or communication. Finally, disease units specific to certain latitudes translate into the health of individuals, and thus into a society's propensity to accumulate physical capital and human capital [Diamond, 1997; Sachs and Warner, 2001, pp. 827–838; Sachs, Gallup and Mellinger, 1999, pp. 407–443]. A different way of explaining the aforementioned differences is through differences in institutional systems. Neoclassical growth theory is able to explain some phenomena in developed countries, while it does not work well in developing countries. Representatives of institutional economics attempt to explain the backwardness of some countries due to underdeveloped property rights and weak contract enforcement, abuse of power or corruption. These arrangements can be the source of high transaction costs, resulting in low factor efficiency [North, 1991, pp. 97–112; Acemoğlu and Robinson, 2012]. Another factor determining differences in the

development levels may be culture, which shapes preferences and norms in the society [Becker, Rubin & Woessmann, 2024].

The purpose of the article is to assess the impact of institutions on economic performance using the example of a broad set of economies over the period 1990–2020. To achieve the goal of the work set in such a way, dynamic panel models were used. Studying the literature on the subject, one can see various tools, but in the study of the panel data, this instrument seems the most appropriate due to the possibility of taking into account endogeneity.

2. Literature review

The institutional approach seems to be the most appropriate to answer the question posed in the introduction. The representatives of this trend see the reasons for the differential wealth of economies in differences in institutional systems. Institutional systems are seen as complex systems that form a bundle of incentives for individuals and for organisations. Thus, they constitute certain frameworks that determine the actions taken by people [Gruszewska, 2017, pp. 37–40]. The institutions themselves are an indispensable component of institutional systems. Taking after North [1990, p. 3], these are the rules of the game in society or, more formally, the man-made constraints that shape human actions. These constraints create the structure of incentives in the sphere of political, social and economic exchange. Institutional changes determine the evolution of societies over time, as well as provide an understanding of historical change. Institutions can be formal, that is, those rules that have been officially established and written down (constitution, legal norms or property rights), or informal, which are seen as customs, traditions, religion, rules of conduct arising from cultural heritage. It should be noted that informal institutions are passed from generation to generation, through imitation and learning. This is a historically shaped process. In addition to formal and informal constraints, institutions should include mechanisms for enforcing them [North, 1991, pp. 97–112]. Completing the review of definitions, it is necessary at this point to emphasise the difference between institutions and organisations. Namely, institutions are the rules of the game, while organisations are the players. These players should be seen as a group of people who share common

goals and take actions to achieve these goals. Organisations act according to the outlined rules of the game. However, they do not remain passive to them, as organisations can contribute to changes in the established rules. There are constant interactions between institutions and organisations contributing to the dynamic changes in the entire institutional system [North, 1990, pp. 4–5].

Changes in the institutional system are a ubiquitous, continuous and gradual process that is a consequence of the choices of individuals and of organisations. The importance of these changes is evident in the very definition of the economic development, according to which production growth must be accompanied by institutional change. It might seem that market forces should lead to the disappearance of inferior institutions and to the survival of only those that lead to increased efficiency. However, based on economic history, it can be seen that only some economies are able to produce an institutional system that is efficient enough to promote production growth and at the same time to bring about further institutional change. This is because the aforementioned constraints create actors who can use their position to create institutions that are inefficient but allow them to preserve their own benefits. This creates solutions that strengthen monopolies. It should be noted that in the case of institutions, market forces are not a sufficient factor leading to the improvement of the institutional system. In this regard, it can be added that adaptive efficiency, i.e. the ability of that system to create conditions and make changes that favor the growth of production, is a desirable feature of an institutional system. This is in contrast to the static neoclassical approach, which focused on allocative efficiency [Toye, 1997, pp. 60–64].

Institutional changes occur as a result of decisions by individuals or by organisations. Most decisions are made routinely, but not all. Sometimes deviating from the established posture patterns can bring positive results. Some altered posture patterns can be made within the existing incentive structure. But sometimes this altered pattern requires a change in the incentive structure itself. Consequently, certain institutions are changed or sometimes disappear altogether. It can be seen that changes in institutions are the result of individuals or organisations recognising that a change in behavior can produce better results. It should be noted that a change in institutions can have an external as well as an internal source [North, 1997, pp. 22–24]. As Toye [1997, pp. 60–67]

points out, the changes due to external factors can be rapid and occur more frequently than the changes due to internal factors. External sources can come from the market, but also occur outside the market. Although North [1997 pp. 22–24] sees the root causes of institutional change as internal sources. They occur as a result of a learning process of idle curiosity, the pace of which depends on the intensity of competition between organisations. Market competition encourages actors to seek new solutions. In contrast, the weakening of competition, extreme to a monopoly situation, leads to a decrease in the motivation to seek new solutions. The rate at which learning occurs determines the rate of economic change, while the type of learning affects the direction of that change. If the incentive structure encourages redistributive activities such as piracy, then the actors will strive to be better pirates. Therefore, it is necessary to strive for an institutional system that will encourage organisations to seek new solutions, thereby leading to allocative efficiency.

The institutional system is a set of institutions that shapes the actions of people and organisations. The synergistic effect of the interaction of these institutions is most important. If there are any conflicts between individual institutions, then this weakens the action of the whole system. The result is a lack of homogeneity of this system, as well as the wrong direction of the actions taken by the actors. A special case is the mismatch between formal institutions and informal institutions. The two types of institutions can reinforce or weaken each other. It should be remembered that informal institutions are more important in day-to-day decision-making than formal institutions. This is due to the fact that they are deeply rooted in people's minds and in the established and socially accepted rules of the actors. Hence, they are difficult to change. For such a change to occur they must evolve. In some cases, informal institutions can evolve into formal institutions. Although this is a lengthy process, it produces a more stable and beneficial end result [Gruszewska, 2017, pp. 37–40]. In this way, an efficient institutional system can be achieved, but maintaining it is also a challenge. As mentioned earlier, this is an ongoing process, and achieving adaptive efficiency is not given once and for all [Rodrik, 2007].

Acemoğlu [2007, pp. 199–201] devotes a great deal of attention to economic institutions, particularly to the structure of property rights, to the functioning of markets and to the ability to enforce contracts. He stresses that these

institutions create an incentive structure for market actors for the efficient allocation of resources. The lack of assigned property rights, results in a lack of incentives to make investments in physical capital, human capital or to seek more efficient solutions.

Acemoğlu and Robinson [2019, pp. 94–99] approach the process of institutional change in a similar way. Namely, they see the process as a competition between the state and society. A strong state is responsible for legislating, providing security and delivering public services. Individuals, on the other hand, must be free, which is seen in any conduct and any disposition of their property. At the same time, society must control the actions of those in power so that they do not overstep the established rules. This process involves mutual cooperation, complementarity, but also competition between the state and society. If both players control each other, it will allow the desired economic results to be obtained. If either player gains the upper hand, then the economy will be thrown off the path of sustainable economic growth. The state may become despotic, meaning that a narrow group of elites will try to gain power and then take steps to maintain it. If a narrow group of elites seizes power in a state, they will act to maintain power and exploit resources for their own benefit, rather than to create an incentive structure conducive to increased efficiency. They will also, within their power, hinder any change in the situation [Acemoğlu and Robinson, 2012, pp. 232–264].

Research between the quality of the institutional system and economic growth emerged in the late 20th century. G. Scully [1988, pp. 652–662] found that the institutional framework has significant consequences for the economic efficiency. His research proved that politically open societies, characterised by the rule of law and predominantly private ownership, grow three times faster than the economies in which these elements of the institutional system are absent. P. Mauro [1995, pp. 681–712] took into account another problem –the problem of corruption. If institutions do not prevent corruption, then the level of investment will be lower, and thus the rate of the economic growth will be lower. What facilitates the implementation of investments are clearly defined property rights. If private ownership prevails in the economy, it will increase the propensity to seek more efficient solutions [Knack and Keefer, 1995, pp. 207–227]. A similar position is presented by J. Aron [2000,

pp. 99–135], who argues that greater efficiency of the institutional system interacts with higher rates of economic growth. It is worth emphasising that this relationship can be bidirectional, as greater efficiency can cause changes in the institutional system. He thus emphasises that the institutional environment is not an exogenous variable, but it can change under the influence of changes in allocative efficiency. M. Vijayaraghavan and W. A. Ward [2001] also used the attribution of property rights as an aproxy for institutions, in addition to using governance, political freedom and the size of government. Using a sample of 43 economies, they indicated that better-defined property rights provide the right incentive for economic activity and result in the increased allocative efficiency. In addition, they pointed out that an excessive state presence in economic life does not increase the rate of economic growth. Emphasising that they considered the quantitative rather than qualitative dimension. The state must not excessively interfere in the economy. In contrast, D. Rodrik & A. Subramanian & F. Trebbi [2004, pp. 131–165] compared the importance of institutions with foreign trade and geographic location. The authors concluded that among the studied variables, institutions are the most important factor in economic growth.

The aspect of the inverse relationship was pointed out by Glaeser et al. [2004, pp. 296–298], as they pointed out that it is the increase in production that improves the institutional environment. The level of production is shaped by human capital and by economic policies rather than by institutions. According to their view, the change in institutions is a secondary effect of the increase in the level of production. A different position is presented by S. Nawaz, N. Iqbal and M. A. Khan [2014, pp. 23–28]. According to them, institutions determine the rate of economic growth. However, they stress that the strength of the impact of the institutional system varies for economies at different levels of development. In developed countries, this influence is greater than in developing economies. In addition, they formulated the conclusion that the paths to the path of sustainable economic growth are also different. In developed countries, attention should be paid to the control of corruption, to the efficiency of governance and to the quality of regulation. In developing economies, on the other hand, the rule of law and voice and accountability are key. This leads to the conclusion that countries at different levels of development require different combinations of the institutional system. On a sample of

48 African countries, the analysed relationship was studied by M. Epaphra and A. H. Kombe [2017, pp. 575–586]. They found no evidence to contradict this relationship, but noted the importance of political stability and refraining from violence and from terrorism. Similar conclusions to S. Nawaz, N. Iqbal and M. A. Khan were drawn by P. Siyakiya [2017, pp. 9–17]. Using a sample of 36 European economies (28 EU members and 8 candidates), he showed that improving the institutional system has a positive impact on economic growth. At the same time indicating that among rich economies this impact is greater than in poorer countries. The positive impact of the efficient institutions on economic growth was also confirmed by Abera, Mulugeta & Melaku [2019, pp. 174–181] and by Sari & Prastiani [2021, pp. 22–26]. It is worth noting the results of Tran, Le and Nguyen, who indicate that an efficient institutional system results in better outcomes in poorer countries than in richer countries. This conclusion stands in opposition to the previously cited research results. The study was conducted on a sample of 48 countries in Asia between 2005 and 2018. According to their findings, the relationship between institutional quality and economic growth is non-linear, as it can have a negative impact once a certain level of institutional efficiency is reached [Tran, Le and Nguyen, 2021, pp. 362–367].

Summarising the presented research results, it can be concluded that the relationship between the quality of the institutional system and economic growth is positive in nature. Better institutions should determine a higher rate of economic growth.

3. Methods

Empirical studies of the impact of institutional quality on economic growth using quantitative methods face several problems. The first concerns the variable describing institutions. It is difficult to construct a single measure or several measures that describe institutions comprehensively [Glaeser et al., 2004, pp. 275–279]. The reasons for this state of affairs can be found in the lack of consensus on what institutions are and in problems with their operationalisation and measurement. Each adopted measure represents a certain simplification and narrowing of the perception of institutions. Attention is

drawn to the fact that the used measures focus on outcomes and not on the institutions themselves [Voigt, 2013; Frericks, Höppner, Och, 2018]. The referenced studies illustrate that among the frequently used measures of institutions there are the property rights or the Worldwide Governance Indicators proposed by Kaufmann and Kraay [Kaufmann, Kraay and Mastruzzi, 2011, pp. 221–242]. The provided measures are not free from flaws, as they are accused of being subjective or of being the effects of institutions themselves, rather than the institutions themselves. The main criticism of the WGI is that it is not based on a fully systematic concept [Voigt, 2013, pp. 21–22]. Although they have their limitations and cannot be seen as fully reflecting the complexity of institutions, whether formal or informal, they do provide some approximation of how institutions actually operate. For the purpose of this study, the Economic Freedom of the World index (EFW) proposed by the Fraser Institute (Fraser Institute) was used. This choice was dictated by the following arguments: long time span, wide geographic scope, and significant proportion of the objective data. This measure is often used as a proxy for institutions [Saravia, 2016].

A different problem is the used research method. A review of the studies illustrated that the research was created at different times. In parallel, the research methods also changed. Starting with the fact that the described relationship can be studied using time series, spatial data, as well as panel data. This study will use panel data, so the author will refer only to the relevant research methods. The first studies were based on the OLS method [Scully, 1988, pp. 652–662; Mauro, 1995, pp. 683–705; Rodrik, Subramanian and Trebbi, 2004, pp. 138–153]. In the following period, static panel models gained popularity [Nawaz, Iqbal and Khan, 2014, pp. 20–27; Epaphra and Kombe, 2017, pp. 573–586; Sari and Prastyani, 2021, pp. 21–22]. More recently, dynamic panel models have been increasingly used [Siyakiya, 2017, pp. 9–11; Abera, Mulugeta and Melaku, 2019, pp. 172–174]. Interest in the use of dynamic panel models stems from the fact that they make it possible to take into account the endogeneity of variables. As emphasised in the literature review, the institutional system should be characterised by adaptive efficiency, and therefore, it should be subject to constant change, which is also confirmed by research results [Aron, 2000, pp. 128–130]. This has caused dynamic panel models to gain popularity in this area of research. An important advantage of dynamic

models over static models is the ability to account for endogeneity. The estimation methods used in static panel models differ from those used in dynamic panel models. The equation of a dynamic panel model can be written as:

$$Y_{it} = \alpha_i + \beta_1 * \beta_{i,t-1} + \beta_2 * Z_{it} + \beta_3 * X_{it} + \delta_t + \varepsilon_{it}$$

where i denotes the country and t the year,
Z_{it} – variable, which we want to check influence on the dependent variable,
X_{it} – variables control in country i and year t,
α_i – individual effects,
δ_i – time specific-effects,
ε_i – error term.

The most commonly used estimation methods in dynamic panel models are the first-difference estimator [Arellano and Bond, 1991, pp. 277–297] and the system estimator [Arellano and Bover, 1995, pp. 29–51; Blundell and Bond, 1998, pp. 115–143]. In the case of the first estimator, the first differences are calculated, while in the second case, two equations are used: one for the differences and the other for the levels. When estimating the equations at the levels, the lagged first differences can be used as instruments [Baltagi, 2005, pp. 135–161].

The data were obtained from public databases, such as the World Bank and the Fraser Institute. GDP per capita (expressed in constant prices) was adopted as the dependent variable, while the control variables included investments as a percentage of GDP and as the average number of years of schooling. The World Economic Freedom Index and democracy measures from Varieties of Democracy were used to measure institutional quality. The study utilised two institutional variables. The Economic Freedom Index was used to represent formal institutions. Informal institutions were represented by a composite variable composed of several diagnostic variables. All variables were converted to stimulants and then their values were averaged. This variable included:

- Judicial Corruption Score;
- Freedom of Expression Index;
- Equality Before the Law and Individual Liberty Index;

- Clientelism Index;
- Electoral Democracy Index;
- Human Rights Index.

The time period of the study spans from 1990 to 2020, but for modeling purposes, 5-year averages were considered. The geographical scope included 114 countries from various levels of development and regions of the world[2]. It should be noted that all variables were treated as endogenous variables. The correctness of this decision is indicated by the tests carried out to verify the correctness of the used instruments.

4. Results

The study attempted to explain changes in GDP per capita (descriptive statistics are included in Table 1 in Appendix) based on institutional frameworks, investments, and human capital (descriptive statistics are included in Table 2 in Appendix), which can be expressed as follows:

$GDPpc_{it} = f(f_inst_{it}, nf_inst_{it}, Invest_{it}, School_{it})$
$GDPpc_{it}$ – real gross domestic product per capita
f_inst_{it} – measure of formal institutions
nf_inst_{it} – measure of informal institutions
$Invst_{it}$ – investment
$School_{it}$ – mean year schooling.

[2] List of countries: Albania, Algeria, Argentina, Australia, Austria, Bangladesh, Barbados, Belgium, Belize, Benin, Bolivia, Botswana, Brazil, Bulgaria, Burundi, Cameroon, Canada, the Central African Republic, Chad, Chile, China, Colombia, the Democratic Republic of the Congo, the Republic of the Congo, Costa Rica, Croatia, Cyprus, Czechia, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Fiji, Finland, France, Gabon, Germany, Ghana, Greece, Guatemala, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kenya, South Korea, Latvia, Lithuania, Luxemburg, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritius, Mexico, Morocco, Myanmar, Namibia, Nepal, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Russia, Rwanda, Senegal, Sierra Leone, Singapore, the Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, the Syrian Arab Republic, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Uganda, Ukraine, the United Kingdom, the United States, Uruguay, Zambia, Zimbabwe.

At the initial stage of the study, the correlation between the variables was verified (Table 3 in Appendix). Based on this analysis, it can be concluded that there is a moderate level of correlation between formal institutions, and the dependent variable, as well as informal institutions and the dependent variable as well as between the variable "School" and the dependent variable. Among the independent variables, the formal institutions and informal institutions showed a moderate level of correlation with the "School" variable. Formal institutions turned out to be moderately correlated with informal institutions. In the next step, the integration level of the individual variables was tested using Fisher's test (Table 4 in Appendix). The results of the test confirmed that the variables are stationary, as the test consistently rejected the null hypothesis in favor of the alternative hypothesis.

Table 5 presents the results of the estimated economic growth models using the Blundell-Bond estimator. Dependent variables included institutions, investment, and human capital. Institutions were included in various variants. The first model included only formal institutions, the second one only informal institutions, and the third model included both formal and informal institutions. Estimation (4) attempted to identify the impact of formal institutions when formal institutions are of low quality. Estimation (5), on the other hand, changed the subsample to countries with high-quality informal institutions. Before conducting inference, diagnostics were performed on the obtained estimates. No second-order autocorrelation was detected in the estimated models based on the Arellano-Bond test. Furthermore, it was found that the instruments used were uncorrelated with the random component.

Considering the obtained estimates, it can be seen that the lagged dependent variable proved statistically significant in each variant. Furthermore, the current value of the dependent variable is strongly dependent on the lagged value. The control variables included investments, which also had a statistically significant impact on GDP per capita. However, the variable reflecting human capital proved statistically insignificant.

TABLE 5

Estimation results of GDP per capita using data from 1990–2020

Variable dependent:	$GDPpc_{i,t}$				
	(1)	(2)	(3)	(4)	(5)
$GDPpc_{i,t-1}$	1.00	1.02	0.99	0.95	0.93
	(p < 0.01)	(p < 0.01)	(p < 0.01)	(p < 0.01)	(p < 0.01)
$f_inst_{i,t}$	1 583.02	–	1 539.37	1 367.60	2 065.02
	(p < 0.01)	–	0,001	(p < 0.01)	(0.007)
$nf_inst_{i,t}$	–	5 096.30	4 267.64	–	–
	–	(0,021)	(0,086)	–	–
$f_inst_{i,t}$ x $nf_inst_{i,t}$	–	–	–	-343.65	614.34
	–	–	–	(0.004)	(0.069)
$Invest_{i,t}$	95.17	122.07	79.80	89.28	100.48
	(0.003)	(0.001)	(0.007)	(0.011)	(0.008)
$School_{i,t}$	43.31	176.37	-99.10	86.12	-108.84
	(0.663)	(0.103)	(0.56)	(0.473)	(0.659)
Arellano-Bond test for AR(2) in differences (p-value)	0.174	0.219	0.204	0.176	0.181
Hansen test of join validity of instruments (p-value)	0.107	0.12	0.248	0.22	0.10
Difference-in-Hansen test (p-value)	0.301	0.351	0.561	0.911	0.55
Number of instruments	81	72	55	88	31

All models content dummy variables of time. P-values are in parentheses. All models were estimated using the Blundell-Bond estimator.

Source: the Author's own elaboration.

The variable reflecting institutions was accounted for in various ways. As already mentioned, in the first estimation, only formal institutions were included. It should be noted that they had a positive and statistically significant impact on the rate of economic growth. In the second estimation, only informal institutions were included, which also proved statistically significant and had

a positive impact on GDP per capita. The third estimation included both formal and informal institutions. Both parameters were statistically significant and positive. It can be concluded that informal institutions had a stronger impact on the rate of economic growth than formal institutions. In the fourth estimation, the impact of formal institutions was compared when informal institutions were of low quality. In this case, the impact of formal institutions was lower than average (obtained in the first estimation). On the other hand, the impact of formal institutions when informal institutions were of high quality was greater than average. Better informal institutions lead to better results from improving formal institutions.

The obtained results are consistent with the findings of previous studies. A better institutional system leads to better economic outcomes. Economies aiming to achieve high economic growth must ensure the creation of appropriate incentives that will encourage entities to engage in productive activities. There is little doubt in this regard. However, the question of how to achieve good institutions remains open.

5. Conclusions

This study attempted to explain the causes of differences in economic growth rates across economies. The literature offers many attempts to answer this question, but there is no unified and coherent response. The study used the approach of institutional economics to address this issue. The goal of this research was to assess the impact of institutions on economic growth, using a broad set of economies (114 countries) as a case study. The time period covered by the study ranged from 1990 to 2020. To achieve this goal, dynamic panel models were employed.

Based on the analysis, it can be concluded that institutions play an important role in driving economic growth. A better institutional system leads to better economic performance. This conclusion is consistent with the findings of other authors. Institutions are important in generating high rates of economic growth. It was noted that formal and informal institutions support each other. Improving the quality of formal institutions within the framework of

high-quality informal institutions produces better economic performance than in the countries with poorer informal institutions. This is consistent with Willimason's conclusion. Countries with strong formal and informal institutions achieve higher rates of economic growth than those characterised by strong formal institutions and weak informal institutions. It is difficult to directly compare the obtained results with those of other authors, as a distinction is usually made based on the level of development (rich and poor countries, or developed and developing countries). S. Nawaz, N. Iqbal, and M. A. Khan pointed out that institutions have a stronger impact in developed countries than in developing countries. Assuming that higher levels of development were dictated by better institutions, this conclusion is consistent. P. Siyakiya presented similar conclusions. However, the question remains: How to achieve better institutions?

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APPENDIX

TABLE 1

Descriptive statistics of GDPpc

Variable	Obs	Mean	Std. Dev.	Min	Max
GDPpc	786	13 411.03	18 280.93	184.33	106 544.10
Region	Obs	Mean	Std. Dev.	Min	Max
North America	12	45 845.95	7 774.93	34 121.61	58 060.31
Europe	230	28 580.11	22 359.30	1 420.12	106 544.10
East Asia & Pacific	98	17 021.62	17 463.39	184.33	58 982.46
Latin America & the Caribbean	161	6 382.81	4 233.18	1 232.30	18 383.54
Middle East & North Africa	54	6 271.02	9 156.42	979.14	37 488.45
Sub-Saharian Africa	196	1 726.84	2 062.05	248.77	9 260.45
South Asia	35	1 275.52	862.78	436.57	4 053.73

Source: the Authors' own elaboration.

TABLE 2
Descriptive statistics of variables

Variable	Obs	Mean	Std. dev.	Min	Max
GDPpc	786	13 411.03	18 280.93	184.33	106 544.10
f_inst	798	6.50	1.30	1.83	9.23
nf_inst	788	0.63	0.21	0.11	0.95
Invest	740	23.10	7.01	1.1	76.78
School	739	7.90	3.32	0.728	14.26

Source: the Author's own elaboration.

TABLE 3
Correlation matrix

	GDPpc	f_inst	nf_inst	Invest	School
GDPpc	1				
f_inst	0.6555	1			
nf_inst	0.6603	0.7105	1		
Invest	0.0378	0.0903	-0.0448	1	
School	0.6547	0.6623	0.6626	0.1054	1

Source: the Author's own elaboration.

TABLE 4
Panel Unit Root Tests

Variable	Statistic	p-value
GDPpc	-8.5692	$p < 0.01$
f_inst	-13.7569	$p < 0.01$
nf_inst	-10.6168	$p < 0.01$
Invest	-11.2478	$p < 0.01$
School	-5.8995	$p < 0.01$

Source: the Author's own elaboration.