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Factors influencing the economic growth of countries depending on the stage of their development

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Abstract

This study examines the economic growth of countries from 2006 to 2018. It is a result of sustainable and intensive development of production, technology, and improvement of living conditions in the country. The main purpose of the study is to understand what the barriers to the transfer of countries to a higher level of development are, based on such factors as Infrastructure, Human Capital, Business Environment, Institutional System, Financial System and Macroeconomic indicators.

The work is based on a sample of 109 countries studied across 431 indicators. The study uses approaches such as "Min-Max" analysis, which aimed to find indicators that differed significantly between groups; the "Average" analysis, will provide a clear indication of the average across factors and countries from 2006 to 2018; and the "1.15" methodology outputs indicators that have improved by more than 15% in 2018 compared to 2006. Through these approaches, we expect to see a clear difference in development between groups of countries.

The result of this paper is that Business Environment, and Financial System and Macroeconomic indicators are important for the transition from low income to lower-middle income group. Further, the country's transition from lower-middle income to upper-middle income is determined by the development of the Infrastructure, Human Capital, Business Environment, Institutional System, and Financial System indicators. And finally, the transition from the upper-middle income group to the high-income group involves the improvement of such indicators as Financial System, Infrastructure, and Human Capital. By developing these factors, the country will be able to overcome the barrier and move to a new stage of development.

Limitations

In this research we encountered the following limitations: the number of countries that we used in the analysis was 109 (many data on countries were not presented in indicators), the number of indicators was 431, since data on indicators in open sources are not fully presented (data were not available for a specific period).

Introduction

Economic growth is one of the most important indicators of the country's development. It ensures continuous sustainable development, intensive development of production and technology, as well as improvement of living conditions. Thus, the study of factors affecting the economic growth of a country is an important task of creating conditions within the country, as well as improving its position on the world stage.

The aim of the paper is to understand, depending on the stage of development of the country, what is a barrier to its transition to a higher level. Factors such as Infrastructure, Human Capital, Business Environment, Institutional System, and Financial System and Macroeconomic indicators are recognized as important for economic growth and affect a country's transition from one group to another. However, the study shows that it is necessary to improve individual elements, which are determined by the country's sophistication and ability to accept progress.

Our study tests 109 countries for possible economic growth between 2006 and 2018 and consists of 431 indicators of different systems. In the process, we applied methods such as dividing countries into groups based on their Income and Complexity indicators. Analysis by "Min-Max," the purpose of which was to find indicators that differed greatly between groups. The "Average" analysis allowed us to visually see the average across factors and countries from 2006 to 2018. The "1.15" methodology outputs indicators that have improved by more than

15% in 2018 compared to 2006. It is expected that we will be able to identify factors that contribute to the economic growth of countries and their transition to more developed groups.

This article has the following structure: first, we looked at various analyses, studies and theories related to the economic growth of countries. Then we collected all the information and indicators necessary for our research. The third is methodology - this is the main part of the article, which describes the analysis in accordance with our goal. The last one is a discussion of the results.

Literature review

Solow (1956) argued that technological progress is a key factor in development, thanks to which some countries are developing much faster than others. The model showed that technological progress leads to increased productivity, which causes an increase in production and income. In addition, Solow's work highlighted the importance of investment in research and development (R&D) as a means of stimulating technological progress, helping to increase productivity and stimulate economic growth. Overall, Solow's work was essential in establishing the importance of technology and innovation, and his model is widely used by economists to examine the relationship between the two.

Advanced technology is a factor that has an impact on economic development. The article "An empirical study of the impact of technological innovation on economic growth - take Shandong Province as an example" says that the development of high-tech industries, as well as innovative technologies have become an important strategic object for the economic growth of countries and entire regions. Jin-Xiu (2019) found that the level of technological innovation, using Shandong province as an example from 2001 to 2016, has a positive impact on economic growth. However, this effect is less than the impact of the capital and labor. Thus, technological innovations can increase labor productivity and the use of production factors,

open new products and consumer markets, promote the emergence of new products, optimize and modernize industrial structures, thereby affecting the development of the economy (Jin-Xiu, 2019).

Hausmann et al. (2014) emphasize that institutions, human capital (quality of education), the financial system and competitiveness have different aspects of the same complexity of the economy. They also have different approaches to the impact of economic growth and development. Variables of economic complexity contain more information about the potential and income of growing countries than other widely used indicators. The above-mentioned indicators such as: human capital, governance institutions, competitiveness best enable the future growth of countries than other indicators.

Infrastructure is the next indicator that play's important role in influencing economic growth. According to Rao and Srinivasu (2013) it includes factors such as transport infrastructure, electricity and water supply, healthcare, education. Investment in infrastructure contributes significantly to economic growth by increasing productivity and quality of life, and contributes to economic growth and reducing economic inequality, poverty, and deprivation in the country (Rao & Srinivasu, 2013).

The next factor influencing a country's economic growth is the financial system. Financial institutions such as banks, insurance companies, and investment firms, help mobilize savings and channel these funds into productive investment. This creates a cycle of investment, as well as creating jobs and increasing consumer spending. However, a dysfunctional financial system can have a negative impact on economic growth. Inadequate regulation, weak governance, and financial instability can all have an impact. Which can ultimately lead to a decline in investment and consumer spending. Levine (1997) states that there is a relationship between financial development and economic growth. The author emphasizes that financial

instruments reduce information and transaction costs that affect the level of savings, investment decisions, technological innovations, and long-term growth rates (Levine, 1997).

Institutions play an important role in the economic growth of countries because they provide the basis for economic activity. The importance of an effective and at the same time transparent management policy that influences the allocation of resources in the country (Acemoglu et al., 2005), setting the pace of investment and the movement of economic growth (Easterly & Levine, 2003). The theory is supported by Scully (1988) "under the influence of the rule of law, private property, and again the uniform distribution of resources, growth in the country comes much faster".

In addition to these indicators affecting economic growth is human capital. Human capital implies that investments in industries such as education, and medicine increase the level of qualification and productivity of workers (Preston et al., 2004). The impact on the economy is due to the improvement of workers' health and spiritual enlightenment (We, 2011).

The article "The Impact of Entrepreneurship on National Economic Growth: Analysis using the GEM database" examines the relationship between total entrepreneurial activity (TEA) and GDP growth in 36 countries, thereby determining the relationship between them (van Stel et al., 2004). The result was positive, but this relationship depends on the economic development of the country. Van Stel et al. (2004) argue that entrepreneurship affects countries in different ways, depending on their level of development. According to Boudreaux (2019) entrepreneurship has an impact on economic growth, but not in all countries. The author's research shows that entrepreneurship has a positive impact on economic growth in developed countries, but negatively affects growth in developing countries. This influence in developing countries is confirmed by Boudreaux (2019) that in this group, necessity-motivated entrepreneurship (NME) is more widespread than opportunity-motivated entrepreneurship

(OME). Revealing the term in simple words, NME is a desire to find a job, and OME is to create your own business. Thus, countries need to pay more attention to OME, at the same time it is necessary to reduce the strong influence of NME this will create the most suitable and favorable environment for business.

There are also other papers that distinguished importance of different factors for economic growth depending on their income level. The study written by Nye et al. (2002) confirms that the expansion of trade leads to a proportional increase in the country's income. And the research by Rioja and Valev (2014) shows that «in low-income countries banks, unlike stock markets, had a positive impact on capital accumulation». The main factors characterizing the weak development of low-income countries, on the example of the country of Uganda, are "corruption, limited sources of financing, substandard utilities and high taxes" that hinder the economic growth of this group of countries (Ishengoma & Kappel, 2011). According to Werker (2013) the factors that are barriers to development of Liberia (low-income country) are Infrastructure (roads, electricity, communications), Financial System (high dependence on external capital, as well as a low level of national savings and attracted investments). Problems also exist in the Institutional system (characterized by weak management measures, except for transparency), and the last factor requires the attention is Human capital (high infant mortality, high birth rate, poor quality of school education). The next one is Timor - Leste that refers to also low income. According to Sacchetto et al. (2021) the factors that are barriers to development of Timor - Leste (low-income country) are the Financial System (Access to credit, rational management of public finances, the presence of DFI in Timor-Leste is minimal due to the low number of domestic producers and the inability to attract investment). Infrastructure also requires solutions to problems (Road construction, Improvement of standards of international airports and air traffic, development of seaports, electricity supply, Internet).

Over time an increase in the country's gross domestic product leads to economic growth. With this transfer of countries from the group of middle-income countries to the group of higher-income countries, the influencing factors are interrelated. The results Zaidi et al. (2019) shows that resources have an impact on the financial system and human capital. Thus, there is a need for the development of human capital and financial institutions for the development of high-income countries.

ICT is one of the driving factors of economic development, developing technologies and infrastructure in countries. Using the example of the country Ukraine (lower – middle income), the author Bilan (2019) argues that the concentration of technology in the country has a positive effect on the economic growth of Ukraine, attracting investment in infrastructure development. According to the authors Hausmann and Klinger (2008) we have identified factors in Pakistan that hinder economic development. Such factors include problems in the field of Institutional System (weak management policy, insufficient stimulation of private sectors by the state, as well as transparency of state structures). There are also problems in Human Capital (the need for qualified labor, poor quality of education), and the latter is Infrastructure (water supply, energy conservation, as well as transport infrastructure, this includes the quality of road surfaces and railway tracks). According to the author Hausmann (2019), there are factors in Jordan (lower middle-income country) that hinder its economic growth. Such factors include the areas of the Financial System (financial constraints and balance of payments), regarding Infrastructure (problems with water supply, as well as problems with high electricity tariffs). According to the authors Hausmann et al. (2005) the main factors affecting El Salvador’s economic growth are the Financial System (high cost of finance), as well as Human Capital (low level of education in the country, affecting the qualifications of the workforce), Institutional System (Property rights, corruption), Taxes which is including in Business environment, also bad Infrastructure.

The economic growth in middle-income countries has been highly uneven. While some countries have experienced rapid and sustained economic growth, others have struggled to make even modest levels of progress. According to Varsakelis (2006) countries can achieve their economic development through investments in Infrastructure, Human Capital, and Financial System as well as through policies that encourage Business Environment. Another important factor influencing development is the Institutional System. Countries with efficient and transparent institutions are more prone to economic growth and development (Varsakelis, 2006).

There are several works on upper middle-income countries, such as Kazakhstan, China, Albania, Namibia, Sri Lanka. According to the authors Barrios et al. (2023) the main problems that the Kazakhstan faces in the development process were identified, such as: Financial System (mainly relatively high lending rates, collateral requirements, and settlement mechanisms), then Human capital (quality of education, experience of work, lack of qualified workers). There are also problems in such areas as Infrastructure (including water supply systems, power grids, the quality of road surfaces, as well as the length of railway tracks), as well as Institutional System (this includes corruption, policy uncertainty, management efficiency and "elite capture"). And the last factor creating barriers to economic prosperity is the Business Environment (limited strategic value) factor.

According to the authors Hausmann et al. (2006) the main problems in China affecting economic growth are the Institutional System (property rights, as well as bankruptcy legislation), Business Environment (tax policy) and Human Capital is also important (lack of knowledge and competencies in the field of technical education and poor development of medicine). According to the authors O'Brien et al. (2017) the main problems of Albania that constraints the economic growth of the country are Institutional Systems (corruption, bureaucracy, political and judicial system), the Business Environment indicator (taxation, as

well as access to land and registration of property). The country's Financial System is also an obstacle (this includes weak financial intermediation, inefficient use of funds and resources, as well as a low level of lending), also important according to O'Brien et al. (2017) is Infrastructure (poor-quality and limited road networks, poor development of international communications, poor condition of railway tracks). The author also identified the Human Capital indicator as problematic, which does not have such a strong impact on the country's economic growth but solving these factors (poor quality of education and lack of skills) would improve the country's standard of living.

According to the authors Hausmann et al. (2022), the main problems in the country affecting economic growth of Namibia are Human Capital (high unemployment, low qualifications of the workforce, poor quality of secondary and higher education), Business Environment (lack of sufficient development of ports for trade), as well as the Financial System (attraction of foreign capital). According to the authors Hausmann et al. (2012), identified the main issues hindering economic development of Tunisia. The problem areas include the Institutional System (the country's legislation and the lack of a legal framework that restricts the rights and activities of private enterprises), also Human Capital (poor quality of education and knowledge), and the last Financial System (problems with lending, as well as the lack of financial support from the state to small and medium-sized businesses). According to a study by Sri Lanka Growth Diagnostic (2018) the main problems in the country affecting economic growth are Infrastructure (water supply, electricity, transport infrastructure). In the Business Environment indicator (tax policy, unstable and unpredictable tax administration policy). Institutions are also an obstacle (access to land, labor legislation, political uncertainty, violations of the rule of law). The study also highlights problematic indicators that do not have a strong impact on the economic growth of the country's countries. Such factors include the

Financial System (interest rate reduction, non-performing loans), as well as Human Capital (quality of education and healthcare).

The studies above show us that countries with the same level of income might have different factors that hinders their development, which is intuitively correct as level of development is not only defined by income per capita but also by the level of economic advancement of the country. For example, Kazakhstan, which mainly exports raw materials, and China, which produces high-tech goods, are both in the upper - middle income group. The theoretical work of Porter (1998) presents an alternative view on the level of development, it divides countries into factor, investment, innovation, and wealth driven economies.

Factor – driven - this economy includes factors such as natural resources, profitable logistics, as well as cheap labor. Groups of these countries are exposed and vulnerable to macroeconomic changes and have low levels of productivity and innovation. To move more into a developed group, according to Porter (1998) such factors of production as: infrastructure development, investment in education, to enter new markets and technologies, improving innovation through business development to the development of new services and products should be based. To access new markets and technologies, it is necessary to open trade and investment.

Investment – driven is a contribution to new equipment and technologies that allows firms to produce goods that are in demand. Thanks to this, countries can improve their competitiveness and influence on the world market. Factors such as a stable domestic market, a supportive government (providing subsidies and services to private sectors), as well as a skilled workforce. According to Porter (1998), these factors contribute to the transition from factor – driven to investment – driven. After the transition of countries to investment – driven, they can compete in more complex industries, therefore this will help to increase wages and

living standards of the population. However, when switching to investment – driven, a country may face such problems as constant investment, competitiveness with other developed countries (Porter, 1998). Thus, overcoming these difficulties thanks to this stage, the country can significantly increase its economic development.

Innovation – driven is an innovation-based economy in which countries can compete by producing new products or services. It is characterized for countries with high development, highly skilled workforce, and high support from the government. According to Porter (1998) factors such as an emphasis on research and development, a highly skilled workforce, and a supportive government contribute to the transition of countries from investment – driven to the innovation – driven group. Countries in innovation – driven due to the presence of sophisticated technologies have higher wages for workers, and the standard of living of the population is much higher. However, in the process of being in this group, countries may face such problems as the constant introduction of innovations and technologies, competition with other countries (Porter, 1998).

Wealth – driven is the last stage of economic development in which the country has achieved perfection and wealth. At this stage, according to the authors, countries are characterized by such negative factors as attracting less investment, stagnation of industrial development, and an increase in unemployment, according to Porter (1998). To avoid these consequences, countries need to return to the period of innovation, to promote and develop the country's economy.

The level of development of countries is determined not only by the level of income, but also by the complexity of the economy. As mentioned earlier, Kazakhstan is still dependent on factors of production, but has incomes comparable to China, which has already moved from investment policy to innovation, although these countries are in the same income level group.

Sum up, we can say that depending on the level of development of the country, the importance of factors such as infrastructure, human capital, the financial system and macroeconomic indicators, institutions and the business environment affect economic growth in different ways. Also, in addition, to consider Porter's analysis, we need to consider how technologically advanced a product the country produces. Therefore, we have divided the countries into groups according not only to their income level, but also to the level of complexity.

Data

Our analysis includes data from 2006 to 2018 in which 8 indexes were taken using public sources. The total number of indicators was 431. The indicators of each index are presented in the range from 0 to 1, where the value of 1 is the maximum. The number of indicators is not presented fully, as we did not have many values, and we also excluded gender indicators. Time span shows the period for which information on this index is presented. All information is described in more detail in the table 1:

Table 1

Index	Point system	Number of indicators	Distribution of indicators	Number of countries	Time span
Global Competitiveness index	From 0–1	120/157	IFS- 13 HC- 19 BE- 43 IS- 28 FS- 17	109/141	2006-2020

Bertelsmann Transformation Index	From 0–1	71/121	IFS- 0 HC- 0 BE- 7 IS- 57 FS- 7	109/137	2006-2020
IMD	From 0–1	17/100	IFS- 1 HC- 2 BE- 6 IS- 4 FS- 4	109/193	2006-2020
World Governance Indicators	From 0–1	6/36	IFS- 0 HC- 0 BE- 0 IS- 6 FS- 0	109/197	2006-2020
Rule of Law Index	From 0–1	44/52	IFS- 0 HC- 0 BE- 0 IS- 44 FS- 0	109/140	2012-2020
Index of Economic Freedom	From 0–1	12/12	IFS-0 HC-0 BE-3 IS- 6 FS- 3	109/184	2006-2020

World Bank Ease of Doing Business Report	From 0–1	152/205	IFS-0 HC-0 BE- 152 IS-0 FS-0	109/197	2006-2020
Human Capital Index	From 0–1	9/27	IFS- 0 HC- 9 BE- 0 IS- 0 FS- 0	109/172	2012, 2016-2020
Total		431	431		

Description of the indexes

Global Competitiveness Index (GCI) conducted by the World Economic Forum. It consists of factors such as infrastructure, health and education, market efficiency, technological innovation, the business environment, and the macroeconomic environment. The purpose of this analysis is to provide insight into the drivers of a country's productivity and economic growth.

The Bertelsmann Transformation Index (BTI), the reason for this examination is to survey political and social integration, financial change, and run the show of law.

The IMD World Competitiveness Ranking positions nations based on financial and social pointers. The reason for this examination is to think about competitiveness utilizing variables: financial markers, open organization effectiveness, trade productivity, and foundation.

World Governance Indicators (WGI) incorporate such markers as voice and responsibility, steadiness in legislative issues, the requirement for government, the rightness of the law, the nonappearance of debasement, and the nonappearance of guiltiness. The most objective is to determine the quality of the open organization.

The Rule of Law Index checks the matchless quality of law in all nations. It incorporates components such as the nonappearance of bribery, the productivity of the legal framework, straightforwardness of the government, enactment, respect, and criminal equity.

The Economic Freedom Index has been checked to determine the financial opportunity of nations. It looks at viewpoints such as the immaculateness of the law, the application of the law, revealed markets, and property rights.

The World Bank's "Ease of Doing Business" report measures how easy it is to do business. It is also useful for potential investors due to factors such as starting a business, obtaining a construction authorization, connecting electricity, registering property, access to financing, protecting investors' rights, taxation, cross-border trade, and solving insolvency problems.

The Human Capital Index measures and assesses how well people use their opportunities in the labor market. It assesses factors such as education, health care, and the quality of employment opportunities.

Missing countries

This table shows the countries that we did not include in the analysis and the reasons:

Table 2

Country	Why we have not included it

Andorra; Antigua and Barbuda; Austria; Barbados; Belgium; Belize; Brunei; Canada; Cape Verde; Comoros; Cyprus; Denmark; Dominica; Federated States of Micronesia; Fiji; Finland; France; Germany; Greece; Grenada; Guyana; Iceland; Ireland; Israel; Italy; Japan; Liechtenstein; Luxemburg; Macedonia; Maldives; Malta; Marshall Islands; Nauru; Netherlands; New Zealand; Norway; Palau; Portugal ;Saint Kitts and Nevis; Saint Lucia; Samoa; San Marino; Sao Tome and Principle; Seychelles; Solomon Islands; South Ossetia; Spain; State of Palestine; Suriname; Sweden; Switzerland; Tonga; Tuvalu; United Kingdom; United States America; Vanuatu; Vatican	The absence of these countries in our list is because we took the countries on the list of The Bertelsmann Transformation Index as a basis. Since, most of the constituent indexers just belong to this index. In this regard, we decided to reduce the number of countries from 193 to 137.
Afghanistan, Benin, Bhutan, Burundi, Central African Republic, Chad, Djibouti, Equatorial Guinea, Eritrea, Gambia, Guinea-Bissau, Haiti, Iraq, Kosovo, Lesotho, Montenegro, Nepal, Niger, North Korea, Rwanda, Sierra Leone, Somalia,	The absence of these countries in our analysis is explained primarily by the fact that these countries do not have ECI or GDP indicators. Eventually, we were unable to identify the economic groups into which these countries could be classified.

South Sudan, Sudan, Syria, Taiwan, Timor-Leste, Venezuela	

Therefore, at the end we received data for this period.

Table 3

Year	Countries	Indicators
• 2006	107	431
• 2008	109	431
• 2010	109	431
• 2012	109	431
• 2014	109	431
• 2016	109	431
• 2018	109	431

Methodology

As mentioned in the literature review different countries has different factors of economic growth, so first we divide countries. We use following methods:

Country division by Economic Complexity Index. We took all the ECI data from 2006-2019 and divided it in quartiles (using number observations). ECI is an indicator of the potential of the economy that is present in the country.

By focusing on those activities that are relatively more complex or offer more opportunities for the country, success can be achieved. The analysis also provides information

about what technological capabilities different countries have and how they can take advantage of them (Hausmann et al., 2014).

Table 4

ECI	Above	Below
Low complexity (Q1)	-3.00	-1,37
Middle-lower complexity (Q2)	-1,37	0,04
Middle-upper complexity (Q3)	0,04	1,45
High complexity (Q4)	1,45	3.00

Country division by Income. First, we took the GNI per capita (constant 2015 US$) data from the World Bank website. Further, based on the 2016 data, since we do not have data for 2015, and the most approximate is 2016, we have created data on these indicators. The data range is shown in the table below. Thus, having formed groups of countries according to GNI indicators, we were able to create a range of GDP, which will be for all years and countries, based on constant 2015 US$.

Table 5

GNI	Above	Below
Low income	0	1025
Lower-middle income	1026	4035
Upper-middle income	4036	12475
High income	12476	

Below is a table with criteria for classifying groups by GDP indicators.

Table 6

GDP	Above	Below
Lower	0	1033
Lower-middle income	1034	4088
Upper-middle income	4089	12797
High income	12798	

On this basis, we obtained groups, which are distributed according to the range of GDP and complexity. Initially we had to have 12 groups, there were such groups: 1,1 – Poor countries with low complexity; 1,2 – Poor countries with lower-middle complexity; 2,1 – Lower-middle income countries with low complexity; 2,2 – Lower-middle income countries with lower-middle complexity; 2,3 – Lower-middle income countries with upper-middle complexity; 3,1 – Upper-middle income countries with low complexity; 3,2 – Upper-middle income countries with lower-middle complexity; 3,3 – Upper-middle income countries with upper-middle complexity; 4,1 – High income countries with low complexity; 4,2 – High income countries with lower-middle complexity; 4,3 - High income countries with upper-middle complexity; 4,4 - High income countries with high complexity.

However, since there were few countries in the groups, we combined some groups. As a result, we have the following table:

Table 7

Income, complexity	Countries (2018)

Group 1 (Poor countries)	Burkina Faso, Congo, DR, Ethiopia, Guinea, Liberia, Madagascar, Malawi, Mali, Mozambique, Tanzania, Togo, Uganda
Group 2,1 (Lower – middle income country with low complexity of production)	Angola, Congo, Rep., Nigeria, Papua New Guinea
Group 2,2 (Lower – middle income country with a lower – middle complexity of production)	Bangladesh, Bolivia, Cambodia, Cameroon, Côte d'Ivoire, Egypt, Eswatini, Ghana, Honduras, Indonesia, Kenya, Kyrgyzstan, Laos, Mauritania, Moldova, Morocco, Myanmar, Nicaragua, Pakistan, Senegal, Tajikistan, Uzbekistan, Yemen, Zambia, Zimbabwe
Group 2,3 (Lower – middle income country with upper – middle complexity of production)	El Salvador, India, Jordan, Philippines, Ukraine, Vietnam
Group 3,1;3,2 (Upper – middle income country with low to lower – middle complexity of production)	Albania, Algeria, Armenia, Azerbaijan, Botswana, Cuba, Dominican Republic, Ecuador, Gabon, Georgia, Guatemala, Iran, Jamaica, Kazakhstan, Libya, Mauritius, Mongolia, Namibia, Paraguay, Peru, Russia, South Africa, Sri Lanka, Turkmenistan
Group 3,3;3,4 (Upper - middle income country with upper – middle to high complexity of production)	Belarus, Bosnia and Herzegovina, Brazil, Bulgaria, China, Colombia, Costa Rica, Lebanon, Malaysia, Mexico, North Macedonia, Romania, Serbia, Thailand, Tunisia, Turkey

Group 4,1;4,2 (High income country with low to lower – middle complexity of production)	Argentina, Chile, Kuwait, Oman, Panama, Qatar, Trinidad and Tobago, United Arab Emirates, Uruguay
Group 4,3 (High income country with upper – middle complexity of production)	Bahrain, Croatia, Estonia, Latvia, Lithuania, Poland, Saudi Arabia, Slovakia
Group 4,4 (High income country with high complexity of production)	Czech Republic, Hungary, Singapore, Slovenia, South Korea

Normalization. Further, we normalized the available values thanks to the normalization formula to obtain values in the range from 0 to 1, to standardize all digits.

Formula: *Normalization = (Index – Min) / (Max – Min)*

To perform this action, we put our indicators in order, ordering them one after another in a certain sequence, and so we did every year. Then, taking the indices for each year separately, we found the minimum and maximum values for each indicator and applied them to our formula. Thus, we got all the values in the range from 0 to 1.

Min - Max Approach. To identify which indicators influenced the growth of this group, we used the min max approach. It implies subtracting the minimum indicator of one group from the maximum indicator of another group. To do this, we take the indicators for each group and compare the two groups with each other. We find the MIN indicator of a developed country and subtract from the MAX indicator of a less developed country. Thus, as a result, indicators are identified that allow us to identify due to which indicator this group is more developed.

1.15 Analysis. These countries have experienced growth over the period from 2006 to 2018, so we have identified indicators that have grown by at least 15% over this period. To reveal this, we took the index for 2006 and 2018, and then divided the value of 2018 by 2006. If the resulting number is greater than 1.15, it means that this indicator has grown.

Below is a table with the average values of the groups for each indicator. To do this, we combined and put together indicators in each direction, such as Infrastructure, Human Capital, Business Environment, Institutional System, and Financial System and Macroeconomic indicators and found the average value of each indicator for a single year.

Table 8

Groups	Indicators	2006	2008	2010	2012	2014	2016	2018
1	IFS	0,2679	0,1476	0,1592	0,1699	0,1421	0,1646	0,1564
	HC	0,4505	0,3454	0,3814	0,3636	0,3456	0,3276	0,3327
	BE	0,4307	0,4032	0,4141	0,4243	0,4155	0,4629	0,4660
	IS	0,4501	0,4218	0,4270	0,4279	0,4191	0,4390	0,4327
	FS	0,4100	0,3327	0,3809	0,3852	0,3697	0,4487	0,4093
2,1	IFS	0,2279	0,1247	0,1467	0,1911	0,1460	0,1388	0,1205
	HC	0,3575	0,3216	0,4405	0,3326	0,3339	0,2705	0,3264
	BE	0,4391	0,4469	0,4484	0,4173	0,4382	0,4762	0,4763
	IS	0,4435	0,4122	0,4295	0,3931	0,4276	0,4349	0,3880
	FS	0,3618	0,3570	0,4091	0,3846	0,3780	0,4044	0,3950
2,2	IFS	0,2505	0,2283	0,2623	0,2417	0,2472	0,2556	0,2521
	HC	0,4345	0,4056	0,4512	0,3979	0,4150	0,4063	0,4321
	BE	0,4559	0,4544	0,4749	0,4566	0,4716	0,4989	0,5009
	IS	0,4641	0,4460	0,4433	0,4197	0,4309	0,4254	0,4179

	FS	0,4391	0,4086	0,4408	0,4039	0,4027	0,4560	0,4193
2,3	IFS	0,2657	0,2894	0,3088	0,2908	0,3144	0,3094	0,3298
	HC	0,4246	0,4973	0,5016	0,4487	0,4530	0,4793	0,5072
	BE	0,4443	0,5114	0,5130	0,5080	0,5235	0,5349	0,5503
	IS	0,4401	0,5158	0,5066	0,4845	0,5049	0,5077	0,5046
	FS	0,4339	0,4721	0,4839	0,4732	0,4586	0,5048	0,5079
3,1;3,2	IFS	0,3646	0,3308	0,3486	0,3170	0,3222	0,3544	0,3637
	HC	0,4861	0,4595	0,5188	0,4327	0,4299	0,4947	0,5164
	BE	0,5067	0,5051	0,5187	0,4903	0,4896	0,5289	0,5363
	IS	0,5673	0,5421	0,5246	0,5043	0,4840	0,5031	0,4928
	FS	0,4960	0,4688	0,4856	0,4693	0,4430	0,4970	0,4679
3,3;3,4	IFS	0,3371	0,4129	0,3951	0,3776	0,3812	0,4017	0,3870
	HC	0,5107	0,5551	0,6033	0,5139	0,5047	0,5620	0,5776
	BE	0,5251	0,5403	0,5623	0,5453	0,5572	0,5919	0,5982
	IS	0,5983	0,5932	0,5847	0,5695	0,5625	0,5292	0,5238
	FS	0,5082	0,5434	0,5306	0,5154	0,5167	0,5332	0,5337
4,1;4,2	IFS	0,3935	0,4552	0,5160	0,4404	0,4891	0,5013	0,4985
	HC	0,5363	0,5254	0,5539	0,5164	0,5654	0,5912	0,5965
	BE	0,4940	0,5342	0,5500	0,5326	0,5741	0,5842	0,5865
	IS	0,5078	0,5244	0,5327	0,5652	0,5668	0,5845	0,6039
	FS	0,4548	0,5400	0,5609	0,5271	0,5374	0,5514	0,5736
4,3	IFS	0,5541	0,4671	0,4497	0,5189	0,5038	0,5186	0,5147
	HC	0,6508	0,6125	0,5833	0,6034	0,5743	0,6256	0,6412
	BE	0,6649	0,5513	0,5738	0,6275	0,5936	0,6450	0,6388

	IS	0,7931	0,6798	0,6384	0,7019	0,6867	0,6885	0,6531
	FS	0,6514	0,5613	0,5475	0,5960	0,5664	0,6062	0,5847
4,4	IFS	0,3938	0,6052	0,6587	0,6463	0,5805	0,5705	0,5931
	HC	0,6915	0,7377	0,7709	0,6697	0,6390	0,6680	0,7200
	BE	0,6612	0,6689	0,6992	0,6721	0,6507	0,6811	0,6958
	IS	0,7389	0,7592	0,7550	0,7348	0,7179	0,7081	0,7082
	FS	0,6168	0,6695	0,6354	0,6043	0,6011	0,6388	0,6534

We have done work with countries that have experienced growth. We identified the average values for each indicator for 2006 and 2018, to clearly see the difference between the indicators. 25 countries have moved to a higher group:

Table 9

Country	Transfer	Indicators	2006	2018
Bangladesh	1,2-2,2	Infrastructure	0,1064	0,2088
		Human Capital	0,3472	0,4168
		Business Environment	0,4272	0,4618
		Institutional System	0,442	0,3911
		Financial system and Macroeconomic indicators	0,4143	0,4396
Myanmar	1,2-2,2	Infrastructure	0,1163	0,0901
		Human Capital	0,3512	0,4568
		Business Environment	0,2663	0,4489
		Institutional System	0,3325	0,3361

		Financial system and Macroeconomic indicators	0,2641	0,2627
Zambia	1,2-2,2	Infrastructure	0,1565	0,181
		Human Capital	0,3555	0,3818
		Business Environment	0,5204	0,518
		Institutional System	0,5537	0,4605
		Financial system and Macroeconomic indicators	0,4609	0,4373
Kyrgyzstan	1,2-2,2	Infrastructure	0,4746	0,2405
		Human Capital	0,5478	0,503
		Business Environment	0,498	0,5142
		Institutional System	0,4613	0,4564
		Financial system and Macroeconomic indicators	0,554	0,4598
Mauritania	2,1-2,2	Infrastructure	0,1861	0,132
		Human Capital	0,3044	0,2643
		Business Environment	0,3815	0,4311
		Institutional System	0,4732	0,3629
		Financial system and Macroeconomic indicators	0,3093	0,2958
Azerbaijan	2,2-3,1	Infrastructure	0,2972	0,5039

		Human Capital	0,4501	0,5869
		Business Environment	0,4441	0,5944
		Institutional System	0,3804	0,4524
		Financial system and Macroeconomic indicators	0,4365	0,4877
Vietnam	2,2-2,3	Infrastructure	0,2308	0,3291
		Human Capital	0,402	0,5376
		Business Environment	0,446	0,5543
		Institutional System	0,379	0,4294
		Financial system and Macroeconomic indicators	0,4503	0,4949
Albania	2,2-3,2	Infrastructure	0,1454	0,3709
		Human Capital	0,4342	0,6269
		Business Environment	0,4515	0,5683
		Institutional System	0,4929	0,5514
		Financial system and Macroeconomic indicators	0,4517	0,5245
Algeria	2,2-3,2	Infrastructure	0,2454	0,3117
		Human Capital	0,4202	0,4863
		Business Environment	0,3664	0,4403
		Institutional System	0,4093	0,4334

		Financial system and Macroeconomic indicators	0,3648	0,3994
Armenia	2,2-3,2	Infrastructure	0,2182	0,3647
		Human Capital	0,4171	0,5542
		Business Environment	0,4274	0,5913
		Institutional System	0,4701	0,4919
		Financial system and Macroeconomic indicators	0,4237	0,4811
Georgia	2,2-3,2	Infrastructure	0,2743	0,41
		Human Capital	0,5062	0,5177
		Business Environment	0,4984	0,6173
		Institutional System	0,5533	0,6104
		Financial system and Macroeconomic indicators	0,5124	0,5059
Guatemala	2,2-3,2	Infrastructure	0,3344	0,2757
		Human Capital	0,4106	0,4072
		Business Environment	0,4803	0,5362
		Institutional System	0,4847	0,4178
		Financial system and Macroeconomic indicators	0,4422	0,5356
Sri Lanka	2,2-3,2	Infrastructure	0,2946	0,3216

		Human Capital	0,5518	0,5646
		Business Environment	0,5095	0,5466
		Institutional System	0,5664	0,5339
		Financial system and Macroeconomic indicators	0,5144	0,4981
Bosnia and Herzegovina	2,3-3,3	Infrastructure	0,1949	0,298
		Human Capital	0,4735	0,5566
		Business Environment	0,4373	0,5255
		Institutional System	0,4643	0,4771
		Financial system and Macroeconomic indicators	0,5031	0,4795
Chile	3,2-4,2	Infrastructure	0,4796	0,4606
		Human Capital	0,517	0,6243
		Business Environment	0,6352	0,6134
		Institutional System	0,7869	0,7505
		Financial system and Macroeconomic indicators	0,652	0,6575
Uruguay	3,3-4,2	Infrastructure	0,6545	0,4744
		Human Capital	0,5144	0,5791
		Business Environment	0,5486	0,5468
		Institutional System	0,8049	0,7886

		Financial system and Macroeconomic indicators	0,6312	0,5596
Panama	3,3-4,2	Infrastructure	0,2239	0,4894
		Human Capital	0,3457	0,4657
		Business Environment	0,5055	0,5864
		Institutional System	0,5537	0,5619
		Financial system and Macroeconomic indicators	0,5596	0,6287
Kuwait	4,1-4,2	Infrastructure	0,4234	0,3942
		Human Capital	0,5385	0,5123
		Business Environment	0,5129	0,527
		Institutional System	0,6064	0,4705
		Financial system and Macroeconomic indicators	0,4071	0,5756
Croatia	3,3-4,3	Infrastructure	0,4285	0,4885
		Human Capital	0,5887	0,6327
		Business Environment	0,5034	0,5845
		Institutional System	0,6553	0,6132
		Financial system and Macroeconomic indicators	0,5191	0,5096
Lithuania	3,3-4,3	Infrastructure	0,1621	0,5184

		Human Capital	0,3701	0,66
		Business Environment	0,5048	0,6782
		Institutional System	0,7114	0,7587
		Financial system and Macroeconomic indicators	0,4941	0,6082
Poland	3,3-4,3	Infrastructure	0,2146	0,4529
		Human Capital	0,4872	0,6462
		Business Environment	0,5286	0,6483
		Institutional System	0,6366	0,6737
		Financial system and Macroeconomic indicators	0,549	0,6124
Slovakia	3,3-4,3	Infrastructure	0,7403	0,4439
		Human Capital	0,7535	0,5879
		Business Environment	0,702	0,644
		Institutional System	0,8579	0,6522
		Financial system and Macroeconomic indicators	0,7001	0,6428
Saudi Arabia	4,2-4,3	Infrastructure	0,3549	0,5017
		Human Capital	0,511	0,5615
		Business Environment	0,5631	0,6049
		Institutional System	0,3854	0,5006

		Financial system and Macroeconomic indicators	0,4681	0,5302
Bahrain	4,2-4,3	Infrastructure	0,5436	0,629
		Human Capital	0,5063	0,6458
		Business Environment	0,5329	0,589
		Institutional System	0,562	0,4884
		Financial system and Macroeconomic indicators	0,6442	0,5149
Hungary	3,4-4,4	Infrastructure	0,2371	0,4527
		Human Capital	0,4807	0,602
		Business Environment	0,5949	0,6107
		Institutional System	0,745	0,5373
		Financial system and Macroeconomic indicators	0,642	0,5758

Results

In our research we used the Min-Max approach, Average method and Methodology 1.15, the results you can see in the applications. Appendix 1 shows the results of comparing group of country Averages, as well as Min-Max analysis. Appendix 2 shows the results of successful countries that improved for 2018. Below we present the overall results, which we divided into groups, considering the transition of countries:

- **The transition from Group 1 to Group 2,2:**

Averages by groups are much better in 2,2 than in 1 in Business Environment and Financial System, while the difference between 1 and 2,1 is only in Business Environment.

We have 5 examples of countries that moved from the lower groups to 2,2 from 2006 to 2018 - Bangladesh, Myanmar, Zambia, Kyrgyzstan, and Mauritania. All but Zambia showed improvement in the Business Environment, while only 1 of them improved in the Financial System. Also, when we analyze the countries that have improved in 2,2 over the years, there is no consensus on improvements over the years: 4 out of 5 countries improved on Business Environment, 3 on Human Capital, 2 on Infrastructure, also Institutional System in Myanmar and Financial system and Macroeconomic indicators in Bangladesh improved slightly.

The most significant improvements in all groups of countries were observed in terms of taxes. If we compare between groups 1-2,2 the indicator "effect of taxation on incentives to work" is very different for countries with successful transition between groups. 3 countries (Bangladesh, Kyrgyzstan, and Mauritania) have improved Total tax rate, (% of profits) indicator. Also, Other taxes, (% of profits) improved in such countries as Zambia, Mauritania and in terms of the indicator "Paying taxes: Profit tax; Total tax and Contribution rate, (% of profit) Kyrgyzstan has also improved.

The difference also affected the Government powers which are effectively limited by the legislature. Despite the lack of improvement in the Institutional System, in all five countries significantly improved the indicator Government effectiveness.

In conclusion, the main difference between group 1 and group 2,2 countries is the Business Environment, in 4/5 of the countries that moved from group 1 to group 2 from 2006 to 2018 it is the business environment that has improved. Analysis by indicators suggests that the main indicator for transition is more efficient taxation. Group 1 countries are much less efficient than group 2,2: country-level analysis shows an improvement in this indicator in all countries.

- **Transition from 2,2 and 2,3 to 3,2 and 3,3:**

According to "Average", the difference between groups 2,2 and 2,3 and groups 3,2 and 3,3 was for indicators such as: Infrastructure, Human Capital, Business Environment, Institutional System, and Financial System and Macroeconomic indicators.

The number of countries that moved from groups 2,2 and 2,3 to groups 3,2 and 3,3 was 9. This includes such countries as Albania, Azerbaijan, Algeria, Armenia, Georgia, Guatemala, Sri Lanka, Bosnia and Herzegovina, and Vietnam. All countries showed improvement on the Business Environment. Meanwhile, 6 out of 9 countries improved on Infrastructure, Human Capital, and Financial System and Macroeconomic indicators, as well as 7 countries showed growth on Institutional System indicators.

The most notable improvements across all groups in the countries also took place in terms of taxes. If we compare between the groups, the indicator of "effect of taxation on incentives to work" is very different for countries with a successful transition between the groups: the indicator Total tax rate, (% profits) improved in 4 countries (Albania, Algeria, Azerbaijan, and Vietnam). The indicator Other taxes, (% of profits) improved significantly, with all countries except Georgia. Indicator Paying taxes: Profit tax, (% of profits) has improved for such countries as Armenia and Georgia. Also Paying taxes: Total tax and contribution rate, (% of profit) improved in 5 countries: Albania, Algeria, Armenia, Bosnia and Herzegovina, and Georgia.

Also, changes have occurred in Human Capital in the quality of education, such indicators as "Quality of the educational system" has improved in 5 countries. These countries include Albania, Algeria, Armenia, Azerbaijan, and Vietnam.

Infrastructure also plays a role in the development of the country, which has improved in 6 countries: 5 countries have improved "Quality of overall infrastructure", except for

Georgia, Sri Lanka, and Guatemala. Indicators "Quality of air transport infrastructure", "Quality of roads", "Individuals using Internet" also improved during this period in 6 countries.

Also, the difference between the groups is present in the "Government powers are effectively limited by the legislature", the improvement in "Institutional System" occurred in 7 countries. Government Integrity indicator - in 7 countries, except Bosnia and Herzegovina and Sri Lanka, Public trust in politicians - in 5 countries, the indicator Government effectiveness for the period from 2006 to 2018 improved in 4 countries out of 9: Albania, Azerbaijan, Georgia, Vietnam.

The Banking System also improved in 6 countries, such as Albania, Algeria, Azerbaijan, Georgia, Guatemala, and Vietnam. The indicator "Government budget balance" improved in 8 out of 9 countries, except for Algeria.

To conclude, the main difference between group 2,2 and 2,3 countries and group 3,2 and 3,3 countries is Business Environment. In 7 of 9 countries that moved from group 2,2 and 2,3 to group 3,2 and 3,3 from 2006 to 2018 has also improved "Institutional System", analysis by indicator suggests that the main indicators for transition are more trustworthy and incorruptible institutional system, effective taxation, better education, and developing better infrastructure to provide comfortable living conditions.

- **Transition 3,2 and 3,3 to 4,2; 4,3 and 4,4:**

According to the Average analysis, the difference between group 3,2; 3,3 and group 4,2; 4,3, and 4,4 was in such indicators as: Infrastructure, Human Capital, Business Environment, Institutional System, and Financial System and Macroeconomic indicators.

11 countries moved from group 3,2; 3,3 (4.1) to group 4.2, 4.3, 4.4. These are countries including: Chile, Uruguay, Panama, Croatia, Lithuania, Poland, Slovakia, Saudi Arabia, Bahrain, Kuwait, Hungary. 9 out of 11 countries showed improvement in Human Capital, 8 out of 11 countries improved Business Environment, 7 out of 11 countries showed growth in

Infrastructure, 6 out of 11 countries improved in Financial System and 4 out of 11 countries showed growth in Institutional System.

The most notable improvements in all groups of countries were in the Financial System and Macroeconomic indicators. Comparing between groups very different indicators: Government budget balance, (% GDP) improved in 7 countries such as: Chile, Croatia, Hungary, Kuwait, Panama, Poland, Slovakia; Gross national savings, (% GDP) indicator in 7 countries: Chile, Croatia, Hungary, Kuwait, Panama, Poland, Saudi Arabia; and Investment Freedom indicator improved in 9 countries out of 11 such as Bahrain, Chile, Croatia, Hungary, Kuwait, Lithuania, Poland, Saudi Arabia, Uruguay.

The Business Environment indicator "Imports and Exports as a percentage of GDP" improved in 6 countries such as: Chile, Croatia, Hungary, Lithuania, Panama, Poland, the indicator Total tax rate, (% profits) improved in 7 countries such as Chile, Croatia, Hungary, Panama, Poland, Slovakia, Uruguay. Also, the group of countries moved from group 3,2; 3,3 (4,1) to group 4,2; 4,3; 4,4 from 2006 to 2018.

Also in the Human Capital indicator, the "Quality of the education system" has improved, and consequently the "Tertiary education enrollment" indicator has increased in eight countries except Kuwait, Slovakia, and Saudi Arabia. The Health Infrastructure indicator improved in only two countries, such as Poland and Croatia.

At the same time, the Infrastructure indicator significantly improved such indicators as "Individuals using Internet" in 9 countries, "Fixed broadband Internet subscriptions/100 pop" in 8 countries. The indicators "Quality of overall infrastructure", "Quality of roads" have improved in five countries, including Croatia, Hungary, Lithuania, Panama, and Poland. "Quality of electricity supply" - Bahrain, Hungary, Lithuania, Panama, Poland.

Institutional system the indicator “Control of Corruption» have increased in 6 countries, Government Integrity in 5 countries, «Legal rights index» indicator in 3 countries.

In summary, the difference between the countries of these groups by analysis of the indicators suggests that the transition from one group to the other is contributed by a better financial system, Institutional System, as well as improvements in infrastructure indicators of increased quality of the Internet, and the improvement in the quality of education.

Conclusion

To summarize our work, we confirm the thesis that the following indicators must be improved and developed to move from one group to another. The Business Environment, and Financial System and Macroeconomic indicators are important for transition from group 1 to group 2. The transition of countries from group 2 to group 3 is conditioned by the development of Infrastructure, Human Capital, Business Environment, Institutional System, and Financial System and Macroeconomic indicators. The transition from group 3 to group 4 includes improvement of such indicators as Financial System, Infrastructure, Human Capital.

Existing research to date and the theory of scientists, confirm the fact that the above-mentioned indicators are interrelated, and their improvement has a significant impact on the transition of countries from one group to another. Thus, contributing to ensure a higher level of development of the country. as well as economic, social, political progress.

Also, in the execution of this study, the comparison methodology was described, in which we focused on the similarity of the elements. In the process, we tried to pull out the greatest number of similar elements, as well as writing out group indicators and the difference between them. We also did not have access to all the data, a lot of countries are not represented the correlation between indicators. Ideally, since these indicators (infrastructure, institutions, etc.) can influence each other, our simple method is only suitable for preliminary analysis, for more in-depth analysis we need to use machine learning, which will allow us to determine the necessary indicators and values more precisely.

As mentioned, we did not have access to all indicators and countries. All the data were taken from the official website of the World Bank. Thus, we analyzed 5 elements (Infrastructure, Human Capital, Business Environment, Institutional System, Financial System and Macroeconomic indicators) in total, which amounted to 431 indicators, also 109 countries were analyzed. The data was taken from 2006 to 2018. Since the pandemic situation, it was not possible to give an accurate estimate, many indicators have fallen from 2020 to 2022. But we also have a table of country transitions from 1995 to 2018, in which we can trace the movement and development of countries during this period. In addition to the 25 countries that we use in this analysis for comparison, we would additionally use another 28 countries (Described in more detail in Appendix 3).

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