AN EMPIRICAL APPROACH TO THE REGULATION OF REGIONAL ECONOMIC INTERACTION SYSTEMS

INTRODUCTION

The current period of development of the world economy is characterized by increased attention to industrial development. It is the industry that becomes the main source of innovation, sets urgent tasks and accumulates the potential for scientific and technological development, and ultimately determines the competitive positions of states in the widest range, including the well-being of the population and national security. The set of features of industrial development today is such that we can talk about the formation of a qualitatively new industry, the so-called Industry 4.0, built on the widespread use of artificial intelligence, the Internet of Things, nature-like technologies, and big data analysis technologies (GERŠL, JÁSOVÁ, 2018). The modern understanding of the industry is becoming broader than before since its development is dialectically interconnected and includes high-tech services, primarily information, and communication. The use of digital technologies leads to the creation of hybrid products that combine the characteristics of both goods and services, without being either in its pure form (LUEDERITZ et al., 2017). However, the economic leadership shortly will belong to those countries that will be able to successfully implement the new industrial revolution in the shortest possible time, make the transition to Industry 4.0. It is not unexpected that such a task is a priority in the activities of the authorities. It is noteworthy that the venue for the second Global Manufacturing and Industrialization Summit (GMIS).

Modern state tax regulation is based on scientific research and practical recommendations developed by representatives of a wide range of schools of economic thought (classical and neoclassical, Keynesian, and public sector theory). The economic realities for which the recommendations were developed are changing, and this leads to the further evolution of tax theory, the search for new more effective forms, methods, and tools of tax regulation (KOSHON, 2018). Ensuring a new industrial revolution in Russia is an extremely complex and non-trivial task that requires the development of new, alternative to traditional, approaches to state regulation, including those implemented in the field of Russian tax policy (LIN, JIA, 2019). The main result of the research was the substantiation of the conceptual differences in the level of socio-economic development in direct dependence on the level of development of institutions and types of public administration. The scope of the practical application of the results of the conducted research was related to their use by state authorities and management bodies, local self-government bodies in justifying the directions, forms, methods, and tools of state regulation of the economy.

METHODS

State regulation of the national economy is an integral part of reproduction in the current reality. The specific directions, forms, and scope of state regulation are determined by the nature and severity of economic and social problems in the country in a particular period (TEPE; GOTTSCALK; KITTEL, 2010). The issue of classifying the types of state regulation of the economy is one of the most significant because the results of the correlation study largely

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depend on it. The authors analyze the classical approaches and modern positions on the allocation of management types to determine the most complete classification that characterizes and defines the differences. Meanwhile, the analysis of modern classifications of types revealed several significant shortcomings in the methodological approach to their establishment. Representatives of the modern economic school distinguish the following types of state regulation: state monopolism; extreme liberalism; mixed type.

It should be noted that by the second half of the 80s. of the 20th century, the result of social progress was the practical exclusion in most Western countries of "extreme" economic mechanisms – a spontaneous self-regulating market or centrally controlled systems. In most cases, countries successfully combine elements of both market and state mechanisms. "All industrialized countries are characterized by a mixed economic system, in which the market determines output and sets prices in most of its sectors, and the state controls the economy as a whole through taxation, spending, and monetary regulation programs. Both sides – the market and the state – are important for the smooth functioning of the economy. The existence of an economy without one of these sides is the same as trying to clap with one hand." Also, the terminological analysis of the classification (KOSMPOSCH, HAFELLNER, 2000) revealed several shortcomings in the use of the categorical apparatus. For example, the concept of "state monopoly" does not characterize the forms and types of state regulation, but rather the form of economic organization in the national economy. Extreme liberalism also ambiguously interprets the type of state regulation, since it is used to characterize not only the economic but also the political, socio-cultural spheres, without reflecting the instrumental essence of the process of regulating the economy. Despite the common approach and the obvious need to use market and state mechanisms, there are certain differences caused by:

a) the spheres of action of the market and the state;

b) the functions performed;

c) forms and methods of state regulation (SLEPOV et al., 2017).

For the above reason, the classification of countries by types of state regulation is based not on modern, but classical approaches. Determining the boundaries and degree of state participation in the economy (the scale of state ownership, the share of the state budget and/or expenditures in GDP, state-funded social services, the conduct of macroeconomic policy, and the microeconomic environment of management) are the most important criteria considered in the typology of national models of economic regulation (RUIZ; CABELLO; PÉREZ-GLADISH, 2018). The state regulation of the national economy is based on various regulatory concepts, which are often defined as alternative ones. From the point of view of identifying the correlation between the type of state regulation of the economy and the level of its development, it is advisable to distinguish the following approaches:

1. Neoclassical, implying automatic regulation of the market system. Within the framework of this concept, judgments about the impossibility of an economic crisis under capitalism or about overcoming accidental economic crises in the framework of free competition dominate.

2. Keynesianism, based on the need for state intervention in the market economy, especially in times of crisis. Even though some representatives of this direction (KOSLLIAS, PALEOLOGOU, 2019; SINEVICIENE, RAILIENE, 2015) defined their details of state regulation, nevertheless, the commonality of the ideas proclaimed by J.M. Keynes acts as a unifying factor in one type (management model).

It should be noted that the differences in the existing types of state regulation of the economy are revealed in the framework of the management of the market economy. Whereas countries in the implementation of economic policy have serious commanding beginnings (first of all, North Korea, as well as Bangladesh, Turkmenistan, Sri Lanka, Saudi Arabia, etc.). Accordingly, when identifying the methodology of correlation between the type of state regulation of the economy and the level of its development, we supplemented the approach of the classics of economic thought. When classifying countries by types of state regulation of the economy, the types with the characteristics of mainly market (analogous to the neoclassical approach
“Laissez-faire”), administrative-command (author’s supplement), and mixed (analogous to the Keynesian-monetarist approach) types of regulation were identified.

In the market type of economic management, the subsystem of the market mechanism prevails, and the methods of state regulation, on the contrary, are minimized. In countries of this type, fiscal methods are mainly used with a small amount of state ownership. With a mixed type of management, various combinations of market and state regulators are formed. It is implemented in the “Japanese”, “Swedish” models, in the model of the socially-oriented market economy of Germany, Austria, in the “Chinese” economy (KOSOV et al., 2018). This type is characterized by the strengthening of the role of the state in economic processes.

The most typical countries in the framework of the mixed type are Germany, Japan, Sweden, Italy, etc. From the point of view of the criteria identified earlier, this type of state is characterized by a combination of a high share of public spending in GDP with the presence of a significant public sector, primarily in the financial sector and infrastructure sectors. Within the framework of the mixed type, the state additionally pays attention to the regulation of social relations, the creation of conditions for effective management, sustainable economic development, and economic security. The foundations of this mechanism are embodied in the models of a socially-oriented market economy. The role of the state in the mixed type of regulation is limited to the performance of the relevant necessary functions, including providing the market with money; regulating external effects; producing public goods; managing the non-market sector of the economy.

It is important to note that the modern type of regulation adopted in most countries is a Keynesian-monetarist synthesis that combines monetary and fiscal policies, public procurement mechanisms, public entrepreneurship, and other forms of government regulation. The totality and combination of these elements form a certain model of regulation of the market economy, which depends on the state of the national economy, the solution of social problems, and the international situation. Methodology for identifying the correlation between the type of state regulation of the economy and the level of its development. It is necessary to combine the methods of quantitative and qualitative analysis to identify the dependence of the type of state regulation of the economy and the level of its development (Table 1).

Table 1. Methodology for identifying the correlation between the type of state regulation of the economy and the level of its development

| 1. Correlation quantitative assessment |
|---------------------------------------|
| 1. Selection of indicators of the level of development of the national economy |
| 2. Statistical evaluation               |
| 3. Econometric estimation              |
| 4. Combining the results of two types of groupings to determine the number of matches |

| 2. Qualitative analysis                |
|---------------------------------------|
| 5. Characteristics of the obtained results of the groups based on the results of calculations (items 2 and 3) |
| 6. Sample characteristics of typical representatives of each group (cluster) |

Source: Compiled by the authors.

Thus, the developed methodology involves a qualitative analysis of groups of countries with different types of state management of the economy, identified previously by quantitative statistical and econometric methods. Let us consider it in more detail.

1. Selection of indicators of the level of development of the national economy.

The most important issue is to analyze the essence of the concept of "economic development level of the economy" and identify indicators that most objectively characterize it. The scientific works of several Russian and foreign authors in terms of indicators of the level of economic development were considered to substantiate the author’s position. It is worth noting that in world practice, the main indicators of economic development are: GDP per capita, trade balance, public debt as a percentage of GDP. However, using only these indicators for analysis is not enough. In particular, such an important indicator as GDP per capita has several
disadvantages. As the Commission of Nobel Prize Laureate in Economics J. Stiglitz notes in an international report:

1) GDP is a market category, the size of which is significantly influenced by inflationary processes and price dynamics. Rising inflation can overestimate GDP and, consequently, living standards. It is for this reason that the level of inflation is considered one of the indicators of economic activity (GRIBANOV, KIRANOV, 2017). Meanwhile, inflation itself is a characteristic of the economy, especially in conditions of hyperinflation. One of the most famous cases was in Zimbabwe, where prices doubled almost every 24 hours at their peak in 2008. Zimbabwe’s currency was so devalued that it was no longer in circulation in 2009. Instead, the people of the country decided to use a variety of currencies, such as the South African rand, the US dollar, and the euro. Based on the set of circumstances discussed above, we propose to use 2 indicators to characterize the inflationary processes in the business environment and their impact on the population: the annual inflation rate and the food inflation rate;

2) GDP is calculated on the “average person”, smoothing the differentiation of profitability by individual groups. According to Miroslav Syrovátka and Martin Schlossarek (2019), it is advisable to take into account inequality indicators in the aggregate indicators of economic development, because inequality, as a rule, hurts the results of economic development. Analyzing in detail the advantages and disadvantages of various indicators, the authors suggest using the Gini index as the most universal, which is confirmed by earlier author’s research (SANNIKOV, 2019). Other, no less important indicators of economic development are considered to be the level of unemployment and the average amount of accrued wages. Therewith, the latter has the disadvantage inherent in GDP, since it is calculated for the "average person". In this aspect, it is most expedient to use modal wages, however, there are no data on it for empirical processing of the author’s methodology;

3) the composition of GDP should be criticized, for example, the inclusion of depreciation, which artificially inflates this indicator, is questionable.

Credit indicators are an equally important indicator of the state of the economy. A study conducted by Adam Geršl and Martina Jašová examines the role of credit variables as indicators of early warning of global crises. The results show that the choice of indicators such as nominal credit growth and changes in the share of loans in GDP have the best signaling properties in developing countries. However, these results are in stark contrast to those for advanced economies, where the gap between credit and GDP is the single most effective indicator of dependency (KING, SMITH, 2014). Based on the fact that the author’s set includes countries of all types, it is proposed to use more universal indicators in the model, along with the volume of lending to the private sector: the refinancing rate and the average loan rate.

Tax indicators are also important, since taxes in most countries of the world are the main sources of government revenue, ensuring the "vital activity of the state". It is enough to recall the Laffer curve, which illustrates the theoretical relationship between tax rates and the resulting levels of government revenue (AKHMADEEV et al., 2016; RUIZ; CABELLO; PÉREZ-GLADISH, 2018). In this connection, the VAT rate, corporate and personal income tax rates are added to the methodology as indicators. If most of the analyzed states have a progressive income tax scale, the following assumptions were used in the study:

1) in countries with no progression, the basic tax rate was used;

2) in countries with the use of progression – the average effective tax rate. Only the basic tax rate was included in the analysis for consumption taxes (VAT, sales tax, and other consumption taxes). It should be borne in mind that the nominal value of rates is not a direct indicator of the effectiveness of the fiscal system and the economy as a whole. In this connection, the tax burden on the economy, % of GDP, is most often used as a fiscal indicator (KOSOV et al., 2019; SIGAREV et al., 2018);

Finally, the authors of the study proposed the following indicators as the 6th group of indicators: the ease of doing business index and the growth rate of industrial production. The fact is that these indicators are widely used by multinational corporations when making decisions about the placement of investments, and, consequently, affect national economic growth through a multiplier effect. The World Bank does a comparison of countries around the world in doing business. Currently, 189 countries participate in the overall assessment. The use
of two business indicators in the study is justified by the fact that the business conduct index itself as a character does not fully reflect the cases when a negative situation is observed in the state according to other business indices. Thus, we selected the following indicators, classified by areas as indicators of the level of development of the national economy (Table 2).

Table 2. Indicators of the level of development of the national economy

| 1. Main macroeconomic indicators: | 2. Indicators of employment, wages, and income: | 3. Inflation indicator |
|----------------------------------|-----------------------------------------------|-----------------------|
| GDP per capita of the population, US dollars | Unemployment rate | annual inflation rate, % |
| trade balance, billion US dollars | Average monthly salary, US dollars | food inflation rate, % |
| Government debt, % of GDP | Gini Index | |
| 4. Fiscal indicators | Human Capital Development Index | |
| Consumption tax rate, % | 5. Credit indicators | 6. Business indicators |
| Corporative tax rate, % | refinancing/discount rate, % | Ease of Doing Business index |
| Income tax rate, % | average loan rate, % | industrial production growth rates |
| the tax burden on the economy, % | |

Source: Compiled by the authors.

It should be noted that the following are the most basic key elements of the methodology:

1. Selection of indicators of the level of development of the national economy.
2. Statistical evaluation
3. Econometric estimation

4. At the next stage, the results of the typological grouping and cluster analysis are compared by determining the number of units of the population that fell into the general groups using two methods. If the number of such coincidences exceeds 70% of the total size of the population, there is a correlation between the type of public administration of the economy and the level of its development by quantitative methods.

The next 5th and 6th stage involve a qualitative and quantitative analysis of the results of the statistical assessment, the selection of typical representatives of the formed groups (from among those identically formed according to a single methodology), and the characteristic of the corresponding type of state management of the economy.

RESULTS AND DISCUSSION

As part of the implementation of the first stage of the study, a database of 17 indicators described above was formed for 127 countries of the world. Based on the obtained database, statistical and cluster grouping was carried out using the cross-sectional method. The results of the typological grouping of countries by types of state regulation of the economy are presented in Table 3.
Table 3. Results of the typological grouping of 127 countries of the world, 2019

|                                        | Countries with a market type of economic management (first group) | Countries involved in the type of economic governance (second group) | Countries with administrative command type of economic management (third group) | On average |
|----------------------------------------|------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------|-----------|
| Number of countries                    | 12                                                               | 93                                                                  | 22                                                                        | 127       |
| Annual inflation rate, %               | 1.74                                                             | 4.95                                                               | 13.13                                                                     | 6.01      |
| Trade balance, billion US dollars      | -4.48                                                            | 0.62                                                               | 6.33                                                                      | 1.12      |
| Consumption tax rate, %               | 11.18                                                            | 17.23                                                              | 12.83                                                                     | 15.98     |
| Loan rate, %                          | 5.70                                                             | 9.80                                                               | 55.96                                                                     | 16.54     |
| Ease of doing business index          | 22.08                                                            | 72.25                                                              | 127.15                                                                    | 76.22     |
| Public debt as % of GDP               | 76.72                                                            | 53.00                                                              | 39.95                                                                     | 52.98     |
| Refinancing rate, %                   | 1.74                                                             | 6.02                                                               | 8.37                                                                      | 5.97      |
| Corporate tax rate, %                 | 22.36                                                            | 22.55                                                              | 21.39                                                                     | 22.33     |
| Income tax rate, %                    | 37.00                                                            | 29.21                                                              | 21.03                                                                     | 28.63     |
| GDP per capita, US Dollars            | 435.38                                                           | 17.974                                                             | 6.174                                                                     | 18.345    |
| Unemployment rate, %                  | 4.05                                                             | 8.34                                                               | 7.39                                                                      | 7.77      |
| Average monthly salary, US dollars    | 2,787.16                                                         | 1,321.38                                                           | 440.28                                                                    | 1,307.13  |
| Gini Index                            | 0.399                                                            | 0.379                                                              | 0.398                                                                     | 0.384     |
| Human Development Index               | 0.88                                                             | 0.76                                                               | 0.67                                                                      | 0.76      |
| Food inflation rate, %                | 1.88                                                             | 5.74                                                               | 14.95                                                                     | 4.91      |
| Production growth rate, %             | 3.17                                                             | 3.33                                                               | 7.42                                                                      | 4.03      |
| The tax burden on the economy, % of GDP| 25.63                                                            | 23.90                                                              | 10.34                                                                     | 21.72     |

Source: Compiled by the authors according to the data (WORLD BANK GROUP, 2020).

Countries with significant elements of market management (USA, Canada, Australia, Ireland, etc.) have higher indicators. GDP per capita in these countries is 7 times higher, the average monthly salary - 6 times, the human development index - 1.3 times; than in countries with elements of the administrative-command type of management (Bangladesh, Iraq, Iran, Syria, Nepal, Zimbabwe, etc.). Also, in countries with a market-based type of economic regulation, the inflation rate is on average 8 times lower, the loan rate is 10 times lower, the refinancing rate is 4 times lower, and the unemployment rate is 3% lower.

The excess of the tax burden in such countries is a positive characteristic of national economies since this indicator characterizes the ability of taxes to redistribute GDP through the fiscal system. It is also important to note that the income tax rate in the market-type countries (more economically developed) is also higher than in the countries of the 2nd and 3rd groups. Considering the results obtained in the author’s previous studies, it can be stated that the states of the 1st group mostly use a progressive taxation scale with fairly high tax rates (PINHEIRO-ALVES, ZAMBUJAL-Oliveira, 2012; KOSOV et al., 2016, 2017). There is no clear correlation between corporate tax rates and consumption taxes (VAT, sales tax). The decline in productivity growth in the third group of countries is also quite understandable from the point of view of convergence - a phenomenon consisting in the outstripping growth rates of developing countries (mainly the third group) over developed countries (mainly the first group). At the next stage, a cluster analysis was performed to confirm the results of the typological grouping.
Table 4. Average characteristics of clusters formed by 17 indicators

| Average, Cluster | Cluster 1 | Cluster 2 | Cluster 3 |
|------------------|-----------|-----------|-----------|
| Annual inflation rate, % | 1.53 | 2.52 | 8.189 |
| trade balance, billion US dollars | -1.28 | -0.31 | 0.623 |
| VAT rate | 21.39 | 22.88 | 17.962 |
| Loan rate, % | 2.73 | 5.51 | 25.186 |
| Ease of doing business index | 26.55 | 41.67 | 92.877 |
| Public debt as % of GDP | 72.11 | 60.83 | 51.403 |
| Refinancing rate, % | 0.81 | 2.45 | 8.587 |
| Corporate tax rate, % | 22.9 | 21.46 | 22.985 |
| Income tax rate | 43.96 | 33.39 | 27.775 |
| GDP per capita, US Dollars | 59,854 | 23,809.29 | 4,538.284 |
| Unemployment rate, % | 4.46 | 6.68 | 8.958 |
| Annual monthly salary, US dollars | 4,003.37 | 1,695.33 | 428.282 |
| Gini Index | 0.32 | 0.35 | 0.415 |
| Human Capital Development Index | 26.55 | 41.67 | 92.877 |
| Food inflation rate, % | 1.53 | 2.52 | 8.189 |
| Production growth rate, % | 21.39 | 22.88 | 17.962 |
| The tax burden on the economy, % of GDP | 4.46 | 6.68 | 8.958 |

Source: Search data.

The analysis of the average characteristics for the obtained clusters allowed determining that the trend towards variability of indicators is not traced for all characteristics. Moreover, the analysis of variance of the indicators used for clustering showed that 6 of the 17 presented indicators were insignificant (Table 5), and therefore they were excluded, and clustering was repeated in order to obtain significant factors (Table 6).

Table 5. Results of the analysis of variance of 17 studied indicators of the economic development level

| Analysis of variance | Between SS | cc | Inside the SS | cc | F | we mean p. |
|----------------------|-----------|----|---------------|----|---|------------|
| Annual inflation rate, % | 9.921254E+02 | 2 | 1.577913E+04 | 106 | 3.3324 | 0.039485 |
| trade balance, billion US dollars | 5.997506E+01 | 2 | 6.39155E+03 | 106 | 0.4973 | 0.609567 |
| VAT rate | 4.95077E+02 | 2 | 2.99127E+04 | 106 | 0.8772 | 0.418948 |
| Loan rate, % | 1.158498E+04 | 2 | 5.631346E+05 | 106 | 1.0903 | 0.339844 |
| Ease of doing business index | 9.100474E+04 | 2 | 1.681153E+05 | 106 | 28.691 | 0 |
| Public debt as % of GDP | 6.941696E+03 | 2 | 1.2923335E+05 | 106 | 2.847 | 0.062465 |
| Refinancing rate, % | 1.2733E+03 | 2 | 4.95707E+03 | 106 | 13.6138 | 0.000005 |
| Corporate tax rate, % | 4.261034E+01 | 2 | 5.594134E+03 | 106 | 0.4037 | 0.558867 |
| Income tax rate | 4.066723E+03 | 2 | 2.498115E+04 | 106 | 8.6322 | 0.000336 |
| GDP per capita, US Dollars | 4.753004E+10 | 2 | 7.610924E+09 | 106 | 330.9839 | 0 |
| Unemployment rate, % | 3.327882E+02 | 2 | 3.727595E+03 | 106 | 4.7317 | 0.010756 |
| Average monthly salary, US dollars | 1.988724E+04 | 2 | 5.277016E+07 | 106 | 199.7385 | 0 |
| Gini Index | 1.767E-01 | 2 | 7.02157E-01 | 106 | 13.3426 | 0.000007 |
| Human Capital Development Index | 1.22256E+00 | 2 | 7.840346E-01 | 106 | 82.6441 | 0 |
| Food inflation rate, % | 1.235626E+03 | 2 | 2.609941E+04 | 106 | 2.5092 | 0.086156 |
| Production growth rate, % | 1.201312E+02 | 2 | 1.261081E+03 | 106 | 5.0489 | 0.008045 |
| The tax burden on the economy, % of GDP | 6.265090E+03 | 2 | 6.192320E+03 | 106 | 56.1905 | 0 |

Source: Search data.
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Table 6. Results of the analysis of variance of 11 studied indicators of the economic development level

| Analysis of variance | Between SS | cc | Inside the SS | cc | F | p mean |
|----------------------|------------|----|---------------|----|----|--------|
| Annual inflation rate, % | 1.002595E+03 | 2 | 1.577978E+04 | 107 | 3.3992 | 0.037046 |
| Ease of doing business index | 8.7308719E+04 | 2 | 1.721942E+05 | 107 | 27.126 | 0 |
| Refinancing rate, % | 1.26156E+03 | 2 | 5.005620E+03 | 107 | 13.4836 | 0.000006 |
| Income tax rate | 4.894023E+03 | 2 | 1.515159E+04 | 107 | 17.8748 | 0 |
| GDP per capita, US Dollars | 4.894923E+10 | 2 | 7.64263E+09 | 107 | 342.5916 | 0 |
| Unemployment rate, % | 2.3499918E+02 | 2 | 3.788980E+03 | 107 | 4.9253 | 0.008991 |
| Average monthly salary, US dollars | 1.954625E+08 | 2 | 5.665392E+07 | 107 | 1845311 | 0 |
| Gini Index | 1.595309E-01 | 2 | 7.333175E-01 | 107 | 11.6388 | 0.000027 |
| Human Capital Development Index | 1.179372E+00 | 2 | 8.823764E-01 | 107 | 76.5952 | 0 |
| Production growth rate, % | 1.074725E+02 | 2 | 1.165462E+03 | 107 | 4.335 | 0.008923 |
| The tax burden on the economy, % of GDP | 6.672410E+03 | 2 | 6.202742E+03 | 107 | 57.551 | 0 |

Source: Search data.

The identification of clusters by significant 11 factors allowed obtaining similar results with the typological statistical grouping (Table 7).

Table 7. Average characteristics of clusters formed by 11 indicators

| Average. Cluster | Cluster 1 | Cluster 2 | Cluster 3 |
|------------------|-----------|-----------|-----------|
| Annual inflation rate, % | 1.59 | 2.52 | 8.197 |
| Ease of doing business index | 27.48 | 41.67 | 91.6 |
| Refinancing rate, % | 0.9 | 2.45 | 8.539 |
| Income tax rate | 42.44 | 33.39 | 25.129 |
| GDP per capita, US Dollars | 59.768 | 23.80929 | 4.592264 |
| Unemployment rate, % | 4.33 | 6.78 | 8.89 |
| Average monthly salary, US dollars | 3.90696 | 1.69533 | 427.31 |
| Gini Index | 0.33 | 0.35 | 0.414 |
| Human Capital Development Index | 0.91 | 0.86 | 0.678 |
| Production growth rate, % | 1.93 | 2.83 | 4.334 |
| The tax burden on the economy, % of GDP | 33.98 | 32.06 | 17.164 |

Source: Search data.

Cluster 1 "Countries with the highest level of economic development“ includes 21 countries (Germany, Great Britain, Australia, the USA, the Netherlands, etc.). This cluster includes 7 out of 12 countries with a market-based type of economic regulation and 14 countries with a mixed type. It should be noted that, as mentioned earlier, the mixed type of management is the most popular at present, the countries of this group are quite heterogeneous in terms of economic development, and then they can fall into different clusters. For example, the 1st cluster includes such economically developed countries with a mixed type of economic management as Denmark, Norway, Finland, Switzerland, and Sweden. The most prominent representative of the group of countries with market regulation of the economy and a high level of its development is the United States of America. The US has the largest economy in the world. The liberal economy of the United States is usually viewed as a form of free enterprise, and one of its distinguishing features is a system of free prices set by companies based on production costs and demand.

Another feature of the US economy is the economic freedom granted to the private sector, allowing it to make the most economic decisions in determining the direction and scale of production. According to data for 2020, the United States ranked 6th in the Doing Business ranking. The US economy is highly diversified by industry, with manufacturing contributing significantly to the national GDP. This is facilitated by the relatively low level of state participation in economic processes, as well as the judicial system, which generally protects property rights and ensures the execution of contracts. It is important to note that although the United States is traditionally classified as a country with a liberal market economy, several areas
of the economy are subject to quite a serious state regulation, in particular energy and agriculture (TIKHONOVA, CHUTCHEVA, 2018; AKHMADEEV et al., 2019).

Cluster 2 “Countries with an average level of economic development” (24 units) includes such countries as Spain, Italy, New Zealand, South Korea, etc. In this cluster, 4 out of 12 countries with a market-based type of economic management and 20 countries with a mixed type are represented. It is important to note that no country with elements of the administrative-command type of regulation was included in the group of economically developed countries and countries with an average level of development. Spain is a typical representative of a group of countries with a mixed type of economic regulation.

Spain has one of the most open and global economies in Europe. According to statistics, the Spanish economy ranks 7th in terms of attracted investments. Also, its companies create 10 percent of jobs and added value in the EU (KOLLMUSS, AGYEMAN, 2002). Spain also ranks third in the world in terms of investment in foreign countries concerning its GDP (60%) – investment is concentrated in regions with high growth potential, especially in Latin America, where Spain is second only to the United States. Such results were achieved, among other things, through active state intervention in the economy (ARTER, 2010).

In particular, the state pays considerable attention to the development of small and medium-sized businesses, the share in GDP of which is large (60% of GDP and 46% of employment is provided by companies with up to 50 employees). The state actively uses not only indirect regulatory instruments (primarily tax ones), which are actively used by market-type countries but also direct ones in the form of budget subsidies. It is particularly important to note the government funding levels in certain sectors. Thus, the state participates in the financing of 70% of the goods sold on the domestic pharmaceutical market. To actively invest in other countries, the state-owned Spanish financial company Compañía Española de Financiación del Desarrollo, COFIDES, was established in 1988, providing medium- and long-term financing for private investment projects that, based on profitability criteria, contribute both to the development of host countries and the internationalization of the economy of Spanish companies (TUCCI, 2011; SLEPOV et al., 2019).

All other states were included in cluster 3, which is quite heterogeneous in composition and includes only one country with a market-based type of economic management-Honduras. This state is an atypical representative of a group of countries with prevailing elements of market regulation, and therefore its entry into the 3rd cluster is permissible. A representative of countries with elements of administrative and command regulation is Indonesia. Even though this country is in the process of forming a market economy, the power of the state remains quite strong. The state of the Indonesian economy depends on the expenditure of the state budget and state ownership (the Central Government owns 141 enterprises). Price regulation for several basic commodities (including rice and electricity) plays a significant role in the Indonesian economy. The country has almost completely nationalized the oil production sector (KARAGIANNI; PEMPEZOGLOU; SARADARIS, 2012).

Considering the fact that in countries with a market type of management, economic development indicators were higher than average, and in countries with elements of the administrative-command type - not, we can conclude that the methodology of cross-statistical and econometric analysis is effective. Comparison of the results of the typological grouping and cluster analysis revealed their compatibility at the level of more than 70%, therefore, the correlation between the type of state regulation of the economy and the level of its development was revealed. Thus, at the moment, predominantly market management of the economy can be effectively implemented only by economically developed states, while the type with significant elements of administrative-command regulation is used by developing countries with a transitional economy and the Third World. Therewith, it is important to note that a clear dependence on countries with a mixed type was not revealed as a result of qualitative heterogeneity.
CONCLUSION

The analysis revealed that there is a direct link between the level of development of the management system and socio-economic, which allows using the experience of other countries to implement economic policies to accelerate economic growth through institutional reforms. Considering the fact that in countries with a market type of management, economic development indicators were higher than average, and in countries with elements of the administrative-command type – not, we can conclude that the methodology of cross-statistical and econometric analysis is effective. Comparison of the results of the typological grouping and cluster analysis revealed their compatibility at the level of more than 70%, therefore, the correlation between the type of state regulation of the economy and the level of its development was revealed. Thus, at the moment, only economically developed countries can effectively implement market-based economic management, while the type with significant elements of administrative and command regulation is used by developing countries, countries with economies in transition, and the "third world" countries. Therewith, it is important to note that a clear dependence on countries with a mixed type was not revealed as a result of qualitative heterogeneity.

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An empirical approach to the regulation of regional economic interaction systems

Uma abordagem empírica para a regulação dos sistemas regionais de interação econômica

Un enfoque empírico de la regulación de los sistemas regionales de interacción económica

Resumo
O tipo moderno de regulação adotado na maioria dos países é uma síntese keynesiana-monetarista que combina políticas monetárias e fiscais, mecanismos de compras públicas, empreendedorismo público e outras formas de regulação governamental. A totalidade e a combinação desses elementos formam um certo modelo de regulação da economia de mercado, que depende do estado da economia nacional, da solução dos problemas sociais e da situação internacional. Na pesquisa científica e prática conduzida, a partir da análise estatística das tendências atuais no desenvolvimento dos estados e do sistema de gestão, mostrou-se a escolha do modelo ideal para a implementação da política econômica. A metodologia da pesquisa baseou-se em um modelo estruturado baseado em indicadores quantitativos (estatísticos) e qualitativos para a correta interpretação teórica dos resultados da pesquisa e métricas-chave, variáveis no estudo. O resultado-chave do estudo foi a conclusão sobre a correção e o alto grau de significância do uso, a metodologia de pesquisa descrita e as conclusões sobre as principais dependências baseadas nos resultados da análise.

Palavras-chave: Sistema de gestão. Finanças. Estado. PIB. Estatística.

Abstract
The modern type of regulation adopted in most countries is a Keynesian-monetarist synthesis that combines monetary and fiscal policies, public procurement mechanisms, public entrepreneurship, and other forms of government regulation. The totality and combination of these elements form a certain model of regulation of the market economy, which depends on the state of the national economy, the solution of social problems, and the international situation. In the conducted scientific and practical research, based on the statistical analysis of current trends in the development of states and the management system, the choice of the optimal model for the implementation of economic policy has been shown. The research methodology has been based on a structured model based on quantitative (statistical data) and qualitative indicators for the correct theoretical interpretation of the research results and key metrics, variables in the study. The key result of the study was the conclusion about the correctness and high degree of significance of the use, the described research methodology, and the conclusions about the key dependencies based on the results of the analysis.

Keywords: Management system. Finance. State. GDP. Statistics.

Resumen
El tipo moderno de regulación adoptado en la mayoría de los países es una síntesis keynesiana-monetarista que combina políticas monetarias y fiscales, mecanismos de contratación pública, emprendimiento público y otras formas de regulación gubernamental. La totalidad y la combinación de estos elementos forman un cierto modelo de regulación de la economía de mercado, que depende del estado de la economía nacional, la solución de los problemas sociales y la situación internacional. En la investigación científica y práctica realizada, se ha demostrado la elección del modelo óptimo para la implementación de la política económica. La metodología de investigación se ha basado en un modelo estructurado basado en indicadores cuantitativos (estadísticos) y cualitativos para la correcta interpretación teórica de los resultados de la investigación y métricas clave, variables del estudio. El resultado clave del estudio fue la conclusión sobre la corrección y el alto grado de significación del uso, la metodología de investigación descrita y las conclusiones sobre las dependencias clave basadas en los resultados del análisis.

Palabras-clave: Sistema de gestión. Finanzas. Estado. PIB. Estadística.