“Modeling of state socio-economic systems in the countries of the European region”

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MODELING OF STATE SOCIO-ECONOMIC SYSTEMS IN THE COUNTRIES OF THE EUROPEAN REGION

Abstract

Recent global economic and social challenges confirm the existence of a number of systemic problems in socio-economic relations. Thus, the spread of the concept of sustainable development, which combines social, environmental and economic aspects, became a characteristic feature of the global development trend in recent decades. Highly developed world countries are currently implementing the principles of social economy (a special state management model for socio-economic development) in their policies with the aim to overcome abovementioned challenges and to reach the millennium development goals. The implementation of these principles, realized by the state management in these countries during the last decades, enables us to evaluate the available results and highlight the characteristics of individual national business models of social economy. The study of the most important social and economic global indicators by means of modeling, clustering and regression analysis made it possible not only to emphasize the most important indicators characterizing socio-economic development, but also, taking into account the establishment of interrelationships between social and economic parameters, to single out separate groups of countries (exclusively the European region has been selected for the research) united by common principles and methods of social and economic policy and its implementation outcomes. The obtained results allow us to predict further trends of socio-economic development of separate groups of countries taking into account the available material and technical resources, the situation on the labor market and the level of competitiveness of national labor resources, the features of the functioning of the monetary and tax systems, etc. Given the results of clustering, it was possible to identify both specific models for socio-economic development specific to certain groups and their inherent tendencies of functioning. Besides, a set of specific methods and mechanisms of government control which are common and the best suitable for these systems is determined.

Keywords socialization, economy, wealth, model, clustering, regression

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INTRODUCTION

The social market economy is a prevailing economic system common for industrialized countries since the middle of the twentieth century. Such a system is characterized by a high level of social and economic well-being of citizens, as well as the existence of a perfect system of socio-economic institutions that govern the functioning of all elements of this system in order to achieve the goals of social justice, security, high standards and quality of life. For example, the West European countries, promoting the ideas of social statehood, implement socio-economic policies not only at the national level but also at supranational levels within the framework of a single EU concept. At the same time, according to the method of implementing the concept of a socially oriented market economy and the results achieved, there is a certain difference between individual modifications of existing

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similar economic systems, which can considerably complicate the understanding of the actual social economy concept.

An economy with high living standards and high social spending (for example, the United States or Canada) is an example of a liberal society that has reached a high level of material well-being that would allow significant allocations to help the poor, financing health care, education and other social sectors; however, there is a lack of mechanisms for reconciling interests of independent social groups existing within this economic system.

Instead, other economic systems (e.g., Switzerland, Austria or Belgium) orient their socio-economic and legal mechanisms towards concerted action to achieve social cohesion and high living standards for the majority of the population, although they are inferior to the leading indicators of the income levels and quality of life in market economies (Dumitru, 2013).

Therefore, according to the authors, the status of exclusively "social economies" can be assigned to the third group of countries (the Scandinavian region), which successfully combine social support system with its own social systems, reaching the general level of well-being and high absolute indicators of sustainable development, in particular, the level of income per capita.

The current aggravation of poverty and social marginalization, enlargement of depressed regions, financial turmoil, food crises, development of new forms of solidarity in the field of environmental protection, culture, education and civil society initiatives have triggered the spread of adaptation to the principles of social economy that give a possibility to protect the rights of individuals in the context of such shocks. Most successfully, the principles of this model are realized on the basis of mutual cooperation of political forces and other social movement participants, which creates international networks and allows achieving global effects in the context of sustainable development. The development and operation of individual social economy actors have currently a real impact on solving global socio-economic problems such as poverty reduction, building a reliable social protection system, universal access to high-quality social services, overcoming unemployment and ensuring effective employment, etc.

A fundamental socially oriented economy is based on the principles of constitutional guarantees of personal rights and freedoms of citizens, freedom and responsibility of entrepreneurship, free choice of profession and place of work, equality of all forms of ownership, guarantees of its inviolability and use in the interests of an individual and society, ensuring the interconnection between the well-being of employees and the outcome of their activities, social protection of the disabled and other socially vulnerable groups, social partnership on the basis of tripartition (government, employers, workers). In addition, any effective social economy takes into account and is characterized by national features that reflect the history of the country, the traditions of the people, the national mentality, the system of upbringing and the attitude towards solidarity, collectivism/individualism, national features of business culture, etc.

1. LITERATURE REVIEW

The social aspects of the economy were a separate object of scientific research both in ancient times and nowadays, since they are still relevant. Thus, R. Owen, A. Saint-Simon, J. Fourier, K. Marx and others developed the concept of "social state", "solidarity economy" considering the principles of socialization of public administration. Confuciy, Platon, A. Smith, and V. Pareto proposed the concept of "general well-being", a certain model of the ideal utopian system that would provide maximum satisfaction of the needs of each individual. The socialization of economic research has become a decisive feature and the main focus of the Nobel Prize winners in recent decades. Thus, R. Hayek criticized the excessive social component of public policy leading to the destruction of

freedom of individualism and democracy resulting in totalitarianism. M. Friedman analyzed the distribution of functional responsibilities in the concept of corporate social responsibility meaning that business is only interested in the effective use of the invested funds, and the state acts as the governing body for the implementation of the social welfare system. J. Tiroll studied state assistance in forming the principles of solidarity and fair functioning of the market. A. Dithon showed the correlation between the categories of public health and the level of wealth and poverty, welfare and economic development. The concept of a solidarity social economy manifests itself in the works of Ukrainian economists, in particular Filipenko (2017), Galchinsky (2013) and others who study the issues of solidarity of the national economy, the role of man in the context of global economic transformations and neo-evolutionary transformations. However, the search for the close relationship between economic and social development indicators, their assessment through the prism of development and the implementation of strategic and operational state management, is still neglected, in particular, given rather powerful changing processes due to the constant transformation of the external environment. It was on the basis of such understanding of the socio-economic development problems that the main task of the article was put as the modeling of relationship between levels of social and economic development.

Mathematical and econometric methods are widely used to access data and analyze economic processes. In particular, Raven (2011) uses empirical analysis, which allows combining the social and economic dimensions of development based on implementing specific models of legal structure and government control. The research of the economic determinants of social policy on the basis of the multilevel regression method is realized in Hjerm (2012) and Dion and Birchfield (2010). Ridley-Duff and Bull (2018) theoretically and empirically contributed to identifying the "desirable discourse" of the social solidarity economy. Global parameters of social economy clustering were also laid down in Stukalo and Shimakhova (2018).

The system of state management in the European region countries has become the main subject of research in different works, the main purpose of which was to identify national identity and regional integration of key areas, mechanisms and methodology of government control (Pillarisetti, 2014), to research proper results of such management system (Read, 2016), its advantages and disadvantages for different social groups (Schwendicke, 2015), its influence on their well-being, wealth and life expectancy, health (Leng, 2015), ect. European Economic and Social Committee (2017) described recent evolution of the social economy in the European Union and its 28 member states that focuses in three areas – the social economy and the emergent concepts/movements related to the space between states and market/for profit businesses, the public policies in their large sense built both in the EU and the member countries in recent years to enhance the social economy sector and measuring the weight of the social economy in each EU Member country. Research of trends in social economy implementation in the EU countries also includes the analyses of policies deployed by governments, at the European and national levels, towards the social economy (Avila & Monzon, 2018), research on trends of social economy application in Eastern Europe (Gagyi, 2018), ect.

Existing approaches to the typology of economic systems and models of state socio-economic policy extend mainly in relation to individual countries and take into account only the scope and principles of social protection and redistribution of these obligations. Social economy, as a phenomenon of the modern stage of development of the world economy, and socio-economic models cover a wider range of issues, in particular, the formation of the role and functions of a human being in the economy as the main subject of production and consumer processes, the object of public administration and social protection and the main resource; the development and implementation of principles, mechanisms, directions and strategies of human resources management at the state level; a social security system; a preventive form of ensuring the welfare and wealth of the country and its population; the concept of social partnership as a direction for the implementation of the principle of social economy solidarity; an economic development strategy, production growth, a tax optimization and fiscal policy; the formation of a quality domain of social services; the ecologization of production and redistribution of products, etc.

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Aims. Taking into account the multifaceted nature of the social economy phenomenon, the article was concerned with typology of the government control in the different social economy models based on the study of key indicators of economic development and the existing social effects expressed in terms of levels of welfare and wealth, providing the population with minimum guarantees by the state, investment in strategic areas that directly influence human development and ensure the quality reproduction of the population and the proper level of its well-being.

2. METHODS

This article aims at modelling the relationship between the levels of social and economic development of the European region. For this purpose, the statistical data of economic and social indicators of 31 countries, such as Austria, Belgium, Bulgaria, the United Kingdom, Greece, Denmark, Estonia, Ireland, Iceland, Spain, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Malta, Germany, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Hungary, Ukraine, Finland, France, the Czech Republic, Croatia and Sweden are analyzed. That is, part of the European region, directly the EU, the Scandinavian region and Ukraine are selected exclusively as the objects of this analysis. To solve the problem of analysis, it is necessary to group and classify the countries with regard to their respective indicators. Based on analytical procedures, processing and grouping statistical data published on the official websites of the national statistical agencies of the analyzed countries, presented in the annual reports of leading organizations, in particular the World Bank, IMF, WTO and other EU regulators, 12 economic and 8 social factors were identified as the main base of econometric modeling.

To construct a mathematical model, a multidimensional mathematical-statistical method of classification analysis – cluster analysis – was used. Its main purpose is to split a plurality of investigated objects and features into homogeneous groups named clusters. The advantage of cluster analysis is that it enables the breakdown of investigated objects not by one sign but by a number of features. Unlike most mathematical methods, it does not impose any restrictions on the kind of objects being considered and allows investigating the set of raw data of arbitrary nature. As a result of cluster analysis, countries with similar values of indicators are combined into one cluster. Before clustering, an orthogonalization was carried out, which was necessary to avoid a high correlation between the indicators. Based on the correlation matrix, the main components were identified. The main component method results in ensuring that the obtained indicators do not correlate. Using the STATISTICA computer program, a hierarchical agglomeration method of clustering was implemented. Objects that are grouped into a single cluster cannot be separated into the next steps in the cluster analysis procedure.

A hierarchical classification, or the construction of a dendrogram, consists in combining observations into clusters using a certain degree of similarity or the "distance" between objects. The diagram starts with the formation of classes, with each containing a single observation. Reducing the meaning of the "communication" measure between them can reduce the boundary after which different observations will be combined into one cluster. This leads to bundling together more and more observations that are less and less similar to each other until there remains a single cluster containing all observations of the sample. If the data in the sample have a certain internal "structure", it should appear on the dendrogram.

Combining observations in clusters occurs using the concept of distance between the observations. The most common way of measuring is the usual or Euclidean distance. If there are two points $x=(x_1,x_2,...,x_n)$ and $y=(y_1,y_2,...,y_n)$ in the n-dimensional space, then the distance $d=(x,y)$ is given by the formula

$$d=(x,y)=\sqrt{\sum_{i=1}^{n}(x_i-y_i)^2}.$$

Usually, before computing distances, the sample is standardized. To this effect, from each value of the characteristic with the number j for the i observation the arithmetic mean is subtrated, and then divided by the standard deviation and calculated for all values of j characteristic. This procedure eliminates the problem of different scales of meas-

uring observational characteristics. The Ward's method uses the dispersion analysis approach, minimizing the sum of the squared deviations for two arbitrary clusters that will be formed in the next step of the clustering procedure.

The choice of the Ward's method, as an agglomeration algorithm, and the choice of Euclidean distance ensures the result stability. As a result of cluster analysis, countries with similar values of indicators are grouped together into one cluster.

3. RESULTS AND DISCUSSION

The main twenty indicators that were considered for analysis can be grouped as follows.

1. Gross Domestic Product (GDP) (1) and GDP per capita (2), which is the main indicator of economic development and the most common indicator of the volume of production of goods and services during the reporting period (The World Bank, 2019). In addition, certain quantitative indicators are analyzed, which allows qualitative assessment of the income and expenditure structure of GDP and its analysis through the prism of budget revenues: the diversification of their sources, the share of business and population through taxation mechanisms, foreign trade structure, foreign direct investment and other external sources, in particular, revenues from international loan facilities, aggravating the country's debt and the volume of maintenance and repayment of external debt. Thus, the following relative indicators (as a percentage of GDP) are taken into account, such as tax revenue (3), which characterizes the level of tax pressure and the share of taxes paid in the structure of the gross product formation; the amount of debt (4), which covers the total debt of the country with regard to external loans and their unpaid interest; foreign trade balance (5); trade balance as a quantitative expression of a qualitative sale of export potential of the country (6); relative indices of foreign direct investment in relation to GDP (7) (The World Bank, 2019).
2. The level of average wealth (per person) (8), which is the aggregate amount of available financial and non-financial assets on the basis of their market value in national currencies and further converted into dollars and estimated at an average inflation rate and expressed in absolute terms, at the expense for every adult citizen (International Monetary Fund, 2018). The total level of the country wealth (9), which includes all financial and non-financial assets (including real estate), net of debt. The share of world wealth (10) is represented by the relative magnitude of the country's participation in world wealth, the volume of which is currently about USD 317 trillion (Global Wealth Report, 2018).
3. The Social Development Index (11) consists of indicators of the environment and social development united in three directions of social progress: basic human needs, well-being and opportunities. It seamlessly complements the GDP and other economic indicators to outline a more holistic view of the country's overall productivity (Social Progress Index, 2018).
4. The Gini coefficient (12) measuring the extent to which the distribution of income (or, in some cases, consumer spending) between individuals or households within the economy deviates from an absolutely even distribution.
5. The Human Development Index (13) represents an aggregate indicator of the human capital quality and trends in its development, in particular, accessibility to and quality of social services, the level of education of the population, the duration and quality of life, the use of human resources, etc. In addition, certain categories are considered which supplement the comprehensive assessment of this aspect of socio-economic development, in particular: life expectancy (14), which, on the one hand, depends on the state of economic development, the income level, the availability of social services, and has a direct impact on the economy of the country, extending the term of use of human resources and forming the country's potential; the level of minimum wage (15) as an indicator of the minimum level of basic household incomes and the value of the minimum marginal level of social guar-

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antees; the cost of pensions (16) (to assess the chosen category of age pension, per person), which characterizes the average welfare of retired people who are dependent on social security, as a qualitative characteristic of implementing the state-assumed obligations under the guaranteed social protection.

6. The budget deductions for health (17) and education (18) (as a GDP percentage) characterize the level of social orientation of the states' economic policies. Quantitative indicators of financing these spheres have a direct impact on the quality of the social sphere, the quality of the provision of social services to all social groups and, accordingly, their effective impact on the population of countries, qualitative indicators of labor potential, cost and competitiveness of human resources.

7. The labor market as a fully socially-oriented market category is characterized by generally accepted indicators such as the level of employment (19) and unemployment (20) among the working-age population (according to the International Labor Organization, these persons include those aged 15-70 years, possessing physical and psychological abilities to work).

According to the authors, the above indicators provide a comprehensive quantitative and qualitative description of the degree of socialization of the economies, characterizing the urgent level of socio-economic development, taking into account generally accepted economic indicators, criteria of social development, and generally weighted aggregate indices and coefficients, which take into account both the social and economic dimension of sustainable development.

The main subjects of the analysis were 31 countries, including 28 EU member states, Norway and Iceland (which geographically belong to the European Scandinavian region but are not EU members), as well as Ukraine.

As a result of mathematical modelling, dendrograms, that is tree-like diagrams, were constructed. EU countries were seen as a homogeneous group in terms of the nature of the relationship between economic indicators and the social development level. 31 analyzed countries were clustered for the 20 key indicators grouped together in groups and selected thresholds, which allows the dendrogram (see Figure 1) to be cut down to the corresponding cluster levels and give them meaningful interpretations.

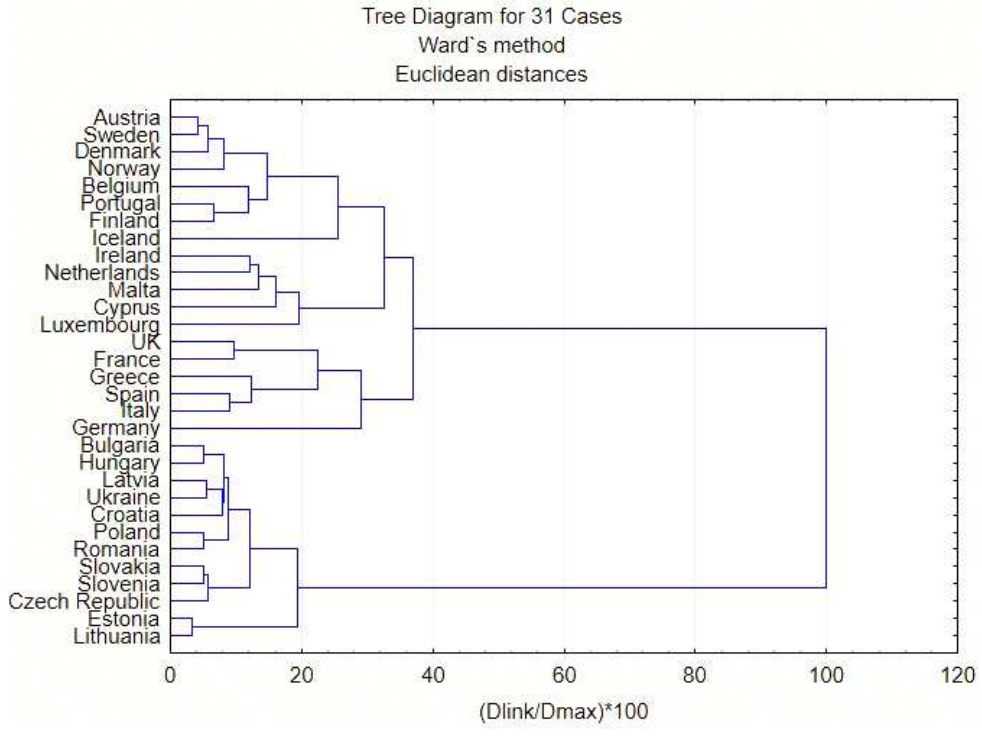

Figure 1. Dendrogram for 31 countries (Ward's method)

While analyzing the dendrogram, it is possible to select the following four clusters:

1. Austria, Sweden, Denmark, Norway, Belgium, Portugal, Finland, Iceland.

2. Ireland, the Netherlands, Malta, Cyprus, Luxembourg.

3. Great Britain, France, Greece, Spain, Italy, Germany.

4. Bulgaria, Hungary, Latvia, Ukraine, Croatia, Poland, Romania, Slovakia, Slovenia, Czech Republic, Lithuania, Estonia.

Countries united into separate groups as a result of cluster analysis, in addition to the generality in the combination of the above-mentioned indicators, have a number of common features, in particular, in the directions and methods of pursuing socio-economic policies, the specific features of the formation of national labor markets and ensuring their inclusiveness, mechanisms for the coordination of migration flows, methods of integration and adaptation of migrants and refugees, ways of forming social safeguards and providing social protection for the population, etc.

The first group is represented by the countries of the continental (Austria, Belgium, Portugal) and Scandinavian (Sweden, Denmark, Norway, Finland and Iceland) models of social policy. These countries are characterized by highly redistributed national wealth through the budget, the implementation of ideas of social solidarity and social partnership, an active preventive nature of social policy based on forming a highly efficient economy (Stjernø, 2005). The universal corporate model of social welfare that is being implemented in these countries involves regulating the level of well-being and maintaining it at a rather high level thanks to a significant share of the funds deducted from the state budget aimed at the social sector development and support. It is indicative of the presence of all the Scandinavian countries in one group, which once again proves the commonality of their policies towards building a social economic model.

Among the countries included in the second group, the Anglo-Saxon model of social policy prevails, and the labor market is at a specific stage of transformation, being influenced by the established European continental model, the existing identities of national systems and their limited influence on the world and, in particular, the European trends of social-economic development. At the same time, the high level of welfare and social orientation of these economies is sufficiently high (high wages and social contributions combined with high economic development indicators) in the absence of a clearly declared economic socialization course.

The third group is the most heterogeneous. Greece, Spain and Italy implement the Mediterranean social model, which mainly provides targeted assistance to the most vulnerable sections of the population, rather than extends to the society as a whole. However, taking into account the balance of the foreign trade, the imbalance of the labor market, the low level of minimum wages, etc., the social guarantees given by the state require a fairly large share of the population. The United Kingdom and France, economically developed and stable countries, offset these positive economic indicators by a relatively low level of socialization (in particular, the level of deductions from the budget for social services, the general social development indices are relatively low) (Miller, 2010). Thus, these two subgroups are united, obviously, by the averaging of the weighted average results and the effects of implementing the urgent course of socio-economic policy. Germany is, however, a relatively perfectly balanced socio-economic system (with the equilibrium of social dimensions and economic indicators). The German model, which is the basis of the continental and general model of the EU, is characterized by the high (more than 50%) volume of the redistribution of gross domestic product through the budget, the formation of insurance funds mainly at the expense of employers, the developed system of social partnership, the policy of maintaining full (or high) employment. It is the social partnership principle, which underlies the social-economic model and unites the countries of this group (CIRIEC Report, 2016). The joint participation of all contracting parties (state, business, employees) in the formation of a socially oriented effective economic system has become the fundamental principle of its functioning and a guarantee of the successful use of differ-

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ent national starting conditions and resource base. However, based on all the above factors, it is advisable to divide this cluster into several subgroups: Great Britain and France; Greece, Italy and Spain; and Germany. This will more realistically reflect the real state of affairs.

The countries of the fourth group are those of the last wave of joining the EU (2004 – Estonia, Latvia, Lithuania, Poland, Slovakia, Slovenia, Hungary, the Czech Republic, 2007 – Bulgaria, Romania; and 2013 – Croatia). It is rather not a cause, but a definite explanation of the commonality of their inherent features. The level of the economy socialization, as well as the strategic directions and methods of implementing socio-economic policy, are determined not by national characteristics, the specifics of the domestic labor market and the material and financial base, but by the existing general concept of the economy socialization, which is currently commonly defined and operates within the EU. Separate socio-economic indicators of these countries are, rather, not determinative, and they tend to the desired weighed average of the European region as a whole. Ukraine's accession to this group, rather than its explicit selection resulting from cluster analysis, indicates a single vector of its development within the EU region. Like the formation of the third group of countries, in this case, the principle of equilibrium of social and economic dimensions of development is in effect. For low economic indicators, the coverage of the population by social programs and relative indicators of allocations from the state budget to the field of social services are very high. However, the expansion of social guarantees and social protection programs, in this case of low absolute economic indicators, is the evidence of the subsidizing nature of development and support as opposed to the desired active socio-economic policy, which involves creating conditions and a perfect material, technical and resource base for development and self-sufficiency.

In general, as a result of the mathematical modeling of cluster analysis, one can conclude that, within the European region framework, at this stage of economic development, the four distinct groups of countries were allocated with the united aims, directions and instruments of social policy, in particular the approaches to the formation of full employment (choice between support for full employment and stimulating the efficiency and competitiveness of production), the development of the social sector (social services are provided through public and/or private organizations), the share of social insurance in budget expenditures for social purposes, targeting of social policy, etc.

To deepen the analysis, additional research was carried out on some selected indicators of socio-economic development in order to determine the level of their influence on the formation of the average level of wealth as one of the key determinants of the population's welfare, which is formed in compliance with the relevant economic climate of the country and the participation of each individual in creating and distributing the gross product and national income. The issue of identifying economic and social factors that have a strong influence on the welfare of the country's population was resolved by the regression method.

A step-by-step regression was used to construct an economic and mathematical model. Step-by-step construction of the linear multiple regression model is used when it is necessary to choose a set of factors from a given set of independent variables (factors or regressors), which are the "most influential" on the dependent variable.

This paper uses multiple linear models. There is one dependent variable and three independent variables in the model. The multiple linear equation of this model is as follows:

$$Y = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \varepsilon,$$

where Y – a dependent variable, X_1, X_2, X_3 – independent variables, α_0, α_1, α_2, α_3 – coefficients of regression, ε – error.

Usually, it is a sequence of the following steps:

- choice of initial set of variables;
- iterative repetition that means the change of model in the current step compared to the previous one by adding or removing an independent variable in accordance with some inclusion criteria;

- stop in the event that further modification of the model is impossible or the maximum number of repetitions has been achieved.

In the "step-by-step regression forward" approach, the initial set of variables is empty, and with "stepwise regression back" it consists of all possible variables. After that, the variable that has the highest value for some inclusion statistics is added to the initial set, and this value exceeds the inclusion threshold. If for any non-included variable set, the value of the inclusion statistics does not exceed the given threshold, then the process is completed. In stepwise regression, a variable that has the least effect, that is, the least value of exclusion statistics exceeding the exclusion threshold, is removed from the setback. As an inclusion/exclusion statistic, *F*-statistics or the value of value (*p*-value) are often used.

To construct a mathematical model, the following factors were considered:

- Gross Domestic Product (GDP);
- GDP per capita;
- Medium wealth level;
- The country's share in world wealth;
- Income from taxation;
- Total debt level;
- Foreign trade turnover;
- Direct foreign investment;
- Social Development Index;
- Gini coefficient;
- Human Development Index;
- Average life expectancy;
- Deductions from the budget on health care;
- Trade balance;
- Employment;
- Unemployment;
- Minimum wage;
- Expenses on pension provision (average age pension, per person).

Thus, all indicators of socioeconomic development that have been taken for analysis as generally accepted and as determinants can be divided into two groups: (1) those that do not affect the weighted average level of wealth of each individual citizen of the country, and (2) those that exert more indirect influence on the formation of such an assessment, and, therefore, should act as the main objects of the state economic model, which is formed on the principle of socialization and with the strategic general aim of raising the general level of the citizens' system.

Group (1) includes the gross domestic product, whose index, although in essence, is a key indicator of economic processes. It is not related to the level of welfare of citizens, because in the presence of high GDP growth rates, provided with the expenditure share of social services (its development, expansion of infrastructure, quality improvement, ensuring wide availability, etc.), the positive tendency of growth in the social component will not be preserved. The share of the country's wealth in the overall structure of world wealth is also not representative, given the difference in the absolute size of the countries and the number of their population; the foreign trade turnover of the country as a purely economic indicator, which forms, in part, the GDP, but does not reflect the proportion of these funds aimed at socialized areas of economic development. Conflicting and ambiguous is the exposure of this group to the minimal impact of such determinative indicators of the labor market in particular, and socio-economic development in general, as indicators of unemployment and employment. This fact can be explained by the preservation of additional wealth characteristics in the form of savings, investments, and, in fact, the value of human capital, even in the event of the loss of direct sources of funding and enrichment, such as wages, which, in the case of unemployment, are partially offset by other types of benefits – social guarantees and benefits.

Group (2) is represented mainly by social indicators that largely depend on economic factors (human development index, which combines social and environmental aspects of human needs formulation and implementation; human development index that assesses human capital in the present and future, taking into account investments in its development and life expectancy), and economic ones that have a direct impact on the social sphere (social tax deductions from the state budget, in particular social services provided in the field of health and education, minimum wages and retirement benefits). After applying the stepwise regression procedure, a set of significant factors is received (Table 1).

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Table 1. The modeling results

Factor	Coefficient	Standard error	The value of *t*-criterion statistics	Achieved value level (*p*-value)
Free coefficient	–1,046,208	163,524.2	–6.4	0.000001
External trade turnover, X_1	410	100.9	4.1	0.000377
Direct foreign investments, X_2	–1,756	495.4	–3.5	0.001460
Life expectancy, X_3	15,039	2,283.6	6.6	0.000000

In the prepared econometric model, the following notation was introduced: Y – dependent variable – the average wealth level (per capita), which is the aggregate expression of available financial and non-financial assets based on their market value in national currencies and further converted into USD, assessed with an average level of inflation and expressed in absolute value on the basis of each adult citizen, expressed in USD. This dependent variable was selected as one of the indicators of the population welfare which includes, in addition to the quantitative indicators of wages and social benefits (pensions, guarantees, grants, allowances), the formation of additional components of the well-being concept – savings, opportunities for investment and increase in the value of assets (both human capital and those that are in its ownership). The most influential factors were also distinguished: foreign trade turnover X_1, foreign direct investment X_2 and life expectancy X_3.

As a result of the calculations, a multiple linear regression model was obtained:

$$Y = 410X_1 - 1756X_2 + 15039_3 - 1046208.$$

The calculated *R*-squared of the multiple linear regression model $R^2 = 0.85$ indicates the adequacy of the mathematical model. Here, 85% of changes in the dependent variable Y (the average wealth level) can be explained by the independent variables X_1 (foreign trade turnover), X_2 (direct foreign investment) and X_3 (life expectancy), while remaining 15% can be explained by the other variables apart from X_1, X_2, X_3 (Hrysenko, 2016).

Thus, the two most important factors which have a real influence on the level of wealth of each individual (citizen of a country) as a social-economic indicator are two economic indicators, namely foreign trade turnover and direct foreign investment; life expectancy is a social indicator characterizing the country's labor potential.

Foreign trade turnover characterizes domestic production and consumption, it is directly dependent on employment indicators, quality of satisfaction of consumer demand, budget revenues due to taxation and customs clearance, etc. The level of direct foreign investment has a direct impact on the development of industrial infrastructure, employment and expansion of the social domain structure, which increases the quality and quantity of population access to social services.

Life expectancy directly depends on the quality of the received social services (medical, educational, valeological, etc.) and directly affects the state of labor resources used in creating the GDP and the formation of the revenue, the costs of which are again realized through social-economic development programs.

CONCLUSION

As a result of clustering, four groups of countries, united by the unity of the state management model of socio-economic development, were identified. The level of socialization of each of them is excellent but different. However, in all of them people, their rights, freedoms and guarantees of their realization are the highest value and the purpose of the development of society and government control. To provide them, the state creates conditions for sustainable and dynamic development of production, raising the level and quality of life of the population based on developing new economic system and technological mode of production, the formation of society with regard to cross-cultural characteristics.

In addition to creating the economic and technological conditions, the active participation of the state is a key factor for the effective functioning and sustainable development of the social economy. The role of the state should balance at the point of the plateau between the overall dominating role and its complete elimination from the process of economic progress. At the same time, social welfare cannot be achieved solely through mechanisms of the market system, passive in relation to efficient allocation of resources, solving social and environmental problems, developing security, etc. Search and achievement of the synergy effect, as well as the active participation of all actors in the socio-economic system, are a prerequisite for the effective socialization of economic processes.

According to the regression analysis results, foreign trade turnover of the country, direct foreign investment and life expectancy are factors that have a greatest impact on the welfare level. These directions should become the key factors in the formation of government control systems of socio-economic development.

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