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CONCEPTUAL MODEL OF MACRO-REGULATION OF SOCIAL-ECONOMIC RELATIONS IN THE CONDITIONS OF INNOVATIVE-INVESTMENT DEVELOPMENT OF UKRAINE

Abstract. The purpose of the study — is to propose and substantiate the conceptual model of macro-regulation of social-economic relations between the state and innovation-active business entities in terms of innovation and investment development of the economy of Ukraine.

The article proposes a systematic approach to building a mechanism for macro-regulation of innovation and investment activities. The influence of innovation and investment changes on the acceleration of social progress is analyzed. The conceptual approach to the formation of the budget strategy of the state in the form of tax deduction from the value added of innovatively active economic entities proposed by the authors is formed on the basis of generalization of modern economic theories.

It was revealed, that only through the growth of gross domestic product it is impossible to overcome poverty and increase the educational and cultural level. This allowed the authors to base the guidelines of methodological and practical aspects on the rational and effective interaction between the state and innovation-active actors of Ukraine, aimed at increasing real income, education, health, greening and general culture of society.

The authors' consideration of the category «quality of life» as a synergistic indicator of social-economic development under the influence of investment and innovation processes allows to more accurately define the tasks, functions, priorities and effectiveness of such macro-regulation. Building new social-economic relations on the basis of the proposed model makes it possible to optimize these processes of interaction taking into account transformational changes in the country's economy and social development, which means benefiting from innovation and high technology in achieving common goals of the state and innovation-active business entities in raising the national level of welfare of society.

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The scientific novelty is to consider macroregulation issues related to building such a synergistic interaction between the state and innovation-active economic entities when material and universal values is created and the achieved positive result from the implementation of changes is comprehensively determined.

***Keywords*:** regulation, interaction, resource, indicators, state, innovations, synergy, system, business entities.

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КОНЦЕПТУАЛЬНА МОДЕЛЬ МАКРОРЕГУЛЮВАННЯ СОЦІАЛЬНО-ЕКОНОМІЧНИХ ВІДНОСИН В УМОВАХ ІННОВАЦІЙНО-ІНВЕСТИЦІЙНОГО РОЗВИТКУ УКРАЇНИ

Анотація. Мета дослідження — запропонувати та обґрунтувати концептуальну модель макрорегулювання соціально-економічних відносин між державою та інноваційно активними суб'єктами господарювання в умовах інноваційно-інвестиційного розвитку економіки України.

Запропоновано системний підхід до побудови механізму макрорегулювання інноваційно-інвестиційної діяльності. Проаналізовано вплив інноваційно-інвестиційних змін на прискорення суспільного прогресу. Запропоновано концептуальний підхід до формування бюджетної стратегії держави шляхом податкового вилучення з додаткової вартості інноваційно активних суб'єктів господарювання сформований на основі узагальнення сучасних економічних теорій. З'ясовано, що тільки за рахунок зростання валового внутрішнього продукту неможливе забезпечення подолання бідності населення і зростання освітнього та загальнокультурного рівня. Це дало можливість базувати орієнтири методологічних і практичних аспектів на раціональній та ефективній взаємодії між

державою та інноваційно активними суб'єктами України, спрямованими на підвищення реального доходу, рівня освіти, здоров'я, екологізації та загальної культури суспільства. Розгляд категорії «якість життя» як синергійного показника соціально-економічного розвитку під впливом інноваційно-інвестиційних процесів дозволяє більш точно визначити завдання, функції, пріоритетні напрями та ефективність такого макрорегулювання. Побудова нових соціально-економічних відносин на основі запропонованої концептуальної моделі дає можливість оптимізувати ці процеси взаємодії з урахуванням трансформаційних зрушень в економіці країни та загальносоціального розвитку, що означає отримання вигоди від упровадження інновацій і високих технологій у досягненні єдиних цілей як самої держави, так і інноваційно активних суб'єктів господарювання в підвищенні загальнонаціонального рівня добробуту суспільства.

Наукова новизна полягає в розгляді питань з макрорегулювання, пов'язаних із побудовою такої синергічної взаємодії між державою та інноваційно активними суб'єктами господарювання, коли створюються матеріальні та загальнолюдські цінності і комплексно визначається досягнутий позитивний результат від запровадження змін.

***Ключові слова*:** регулювання, взаємодія, ресурс, показники, держава, інновації, синергія, система, суб'єкти господарювання.

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Introduction. The Ukrainian economy needs an infusion of considerable means for modernization of existing and creation of new production requiring new technique and technology. Scientists predict that the states, that manage to surpass others in mastering of technologies and products, answering modern requirements, will prosper in the future [3; 5; 6; 8; 9; 14; 15]. This became especially relevant in the period of increasing informatization and digitalization of every socio-economic processes and relationships. Currently, the protracted crisis in Ukraine, which began in 2014 and continues under the influence of the globalization crisis, COVID-19 dictates the transition to new transformations in every sectors of the economy and social sphere. This is also dictated by evolutionary processes, namely the transition to a new 6th technological structure of the economy in the production of high value-added products, characterized by individualization, nanominiaturisation, biotechnology, cognitivization, development of 3D printing through reindustrialization, in increase in the national economy based on these technologies mainly in the field of small business.

Nowadays, the innovative activity of small and medium-sized businesses is carried out mainly in line with the catching-up strategy. Given the set of constraining conditions of innovation (limited financial resources, lack of time in a significant technological lag), such a strategy of enterprises is forced, but to some extent objectively necessary at the present stage. That is why there is a need to introduce such a model of macro-regulation of socio-economic relations between the state and innovation-active economic entities, which could encourage innovation based on mutual benefits, which further leads to a synergistic result in improving the «quality of life» and welfare of society.

Research analysis and problem statement. In the Ukrainian economy a situation is such, that the task of maintenance of necessary rates of growth through innovative development does not support itself by the structure of investments. So, from data of Razumkov center, the sources of long-term investments in the Ukrainian economy are foreign investments, but their structure is such, that they do not provide new technologies. The share of these investments is small and besides it has a tendency for reduction. Priority should be given to foreign direct investment in the development of high-tech and science-intensive industries, which contribute to the expansion of export potential and strengthen the competitiveness of Ukrainian goods on world markets. At the same time, it is not a question of neglecting the established connections in the traditional branches of the Ukrainian economy, in which investors have invested. These include the food and chemical industries, metallurgy, mechanical engineering, construction materials production and agriculture [1]. Meantime in the USA, Japan, Germany basic investments are directed towards science intense

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industries, hi-tech production. In the World the volume of trading in public science intense production the share of the USA makes 36%, Japan — 30%, Germany — 17%, China — 6%, Ukraine — only 0,1% [2]. This indicates substantial technological lag of Ukraine comparing to countries considered to be forward looking.

To remedy the situation, in the opinion of scientists O. A. Kirichenko, Yu. I. Vyhivska [3], it is required to activate present scientific and production potential by means of scientifically-technological development. The fact, according to the team of authors [4], that technologies are considerable productive force, has a sufficient ground found in an economic theory and it is well-proven by practice. Essentially, the development of productive forces began with technological specialization expressed in the after branch division of labor. As researches show N. M. Kraus [5], possibilities of scientifically-technological development were not used identically by different countries. Here happened scientifically-technological breakthrough of some countries and inferiority of the others. For the others, overcoming of scientifically-technological inferiority became big problem.

The purpose of the article is to build socio-economic relations between the state and innovatively active business entities in the context of the innovative development model of Ukraine.

Results of the research. Among the main articles of research of modern economic theory on this issue, the transformation of scientifically-technological potential into economic and another kinds of potentials. One of basic directions of such transformation is innovative-investment change. They solve an economic task through creation of hi-tech productions and creation of a product of the certain consumer and exchange value. Consistently the problem of scientifically-technological progress and as a result a problem of public progress is solved by this, including socially-material, general-cultural, socially-moral and other kinds (*Fig. 1*).

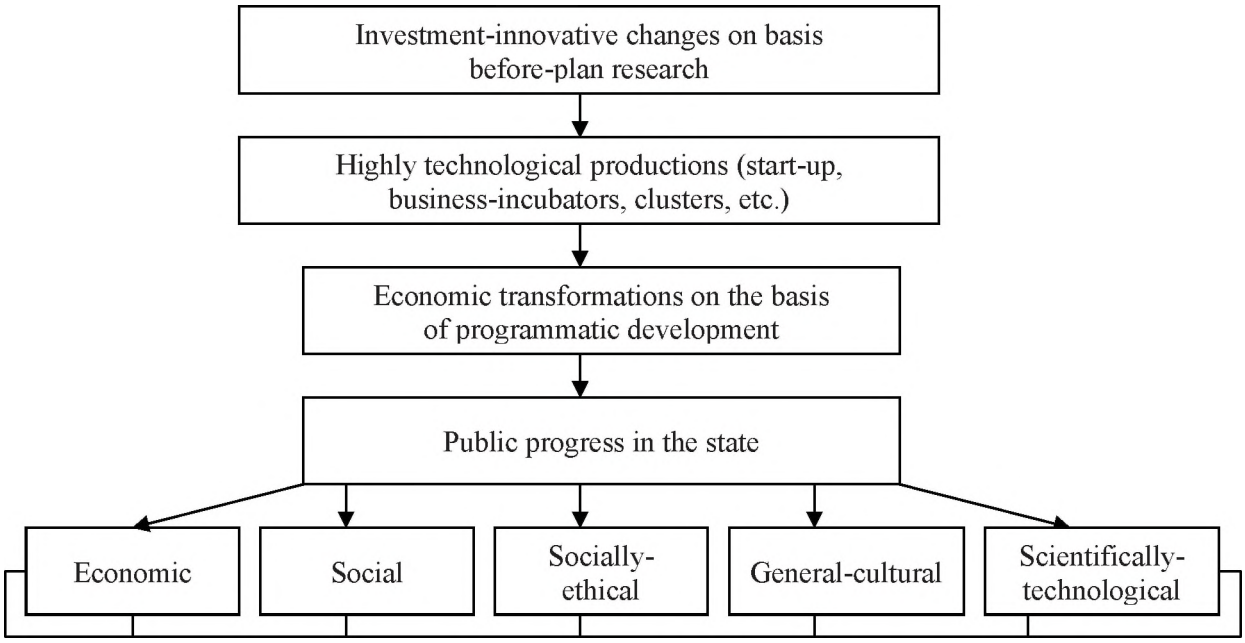

Fig. 1. **Conceptual chart of influence of investment-innovative changes on public progress in Ukraine**

Source: created by the authors based on [8].

The most effect is achieved when the investments deposited in innovations correspond to the scale of innovative-investment development. However, as shown above, counting on external investments is not especially necessary. Therefore a better way out from created situation may be better use of own investment resource, which bases on the process of investment-innovative changes made by producible managing subjects by adding value. Part of this value in a form of a tax goes to the state for fulfillment of the social function, other part as a net income remains with innovative-active subjects and for the most part invested by them in an innovative-investment.

The conceptual scheme of distribution of added value between the state and innovative-active subjects is provided in *Fig. 2*.

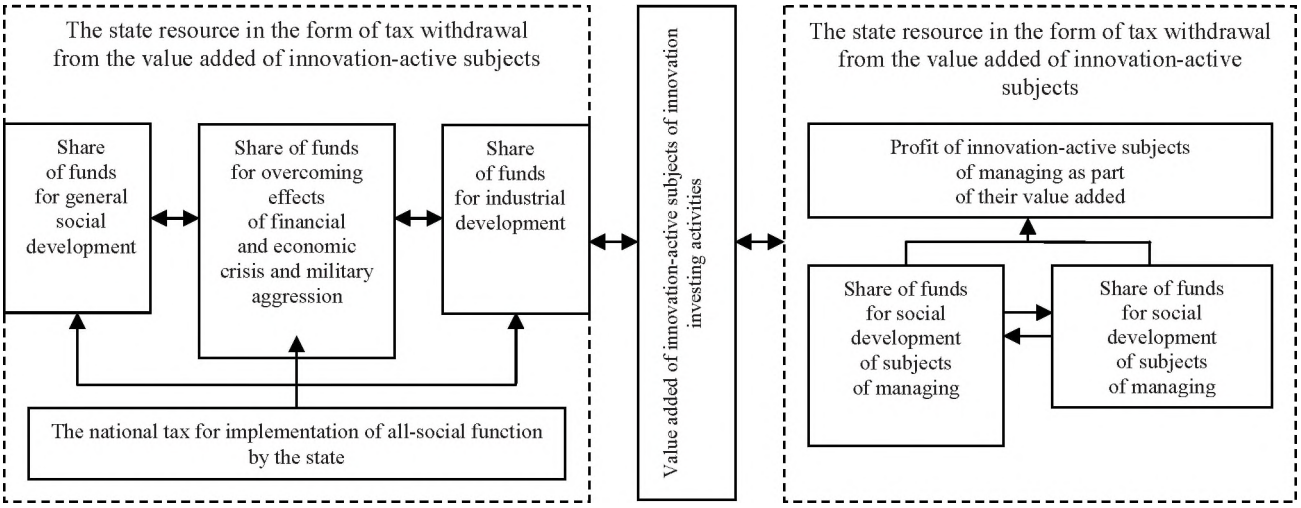

Fig. 2. **A conceptual approach to the formation of the state's budget strategy for its development**

Source: created by the authors based on [6].

However forming of parts of a resource from the added value of accounting entities from innovation investing activities carries some inconsistency in itself. On the one hand, caring for the general social progress, the state, naturally, is interested in receiving the greatest possible part of added value. On the other hand, an increase of the state's share of added value can lower the possibilities of investment innovative development of accounting entities. It can occur in a direct way, for example by means of increase by the state of its share of added value taken as a tax and consequently, by reduction of a share of accounting entities, and as a result of reduction of size of their net profit which is the main component of a resource of investment innovative development. Formally it looks as follows:

$$D_d \longrightarrow D_{d\ max}, \text{ therefore } D_c \longrightarrow D_{c\ min} \text{ at } D_c = \text{const}. \quad (1)$$

Thus, when the part of the state in the added value of D_d aims at the maximum size $D_{g\ max}$, the part of profit of an accounting entity of D_c will decrease to $D_{c\ min}$. And there's no guarantee that this could not occur [6].

The state receives a part of added value depending on the tax burden established by itself and, based on its interests, it can always substantiate the reason for change. According to A. Laffer's theory there is relationship between income and size of a tax burden described by a parabola with a maximum point after which any growth in incomes stops and further there is only decrease (from here, in essence, investment innovative development of an accounting entity by their own means stops). Therefore an aspiration of the state to receive as much as possible means for development of all-social function and the decision of increase of a tax burden made from these positions, perhaps, estimated by it as effective, can be absolutely inefficient for accounting entities [7].

The macroeconomic theory indicates that the solution of this problem is in the plane of finding of an optimum combination of needs of the state and accounting entities. It can be achieved by modeling relationship, equally profitable for them: to build them not by a primitive method, not reasonable economically administrative and strong-willed influence at establishment's size of tax burden, and on the basis of a really reached level of social and economic development of society.

One of the indicators of achievement of it is the balance of benefits satisfying both parties is the result of implementation of the social function which is not leading to decrease or control of investment innovative development of accounting entities. Conceptually the balance of the satisfied needs of the state and accounting entities can be expressed as the following economic-mathematical model:

$$RISF_g \text{ corresponds to } IIR_{xc} \text{ at } IIR^0_{xc} \geq IIR^b_{xc}, \quad (2)$$

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where $RISF_g$ — result of implementation of social function by the state;

IIR_{xc} — the investment and innovation result received by an accounting entity;

IIR^0_{xc} IIR^b_{xc} — respectively the investment and innovation result of an accounting entity expected and achieved in a base period.

On condition of innovation and investment development the model takes the following form:

$$RISF_g \text{ corresponds } IIR_{xc} \text{ at } IIR^0_{xc} = IIR^b_{xc} + \Delta IIR, \quad (3)$$

where Δ IIR — the exceeding size of actually achieved investment and innovation result over the planned one.

Action of this model promotes distribution of added value: 1) taking into account investment and innovation and all-social development; 2) allocation of their priority directions; 3) achievement of balance of the resource used for this or that in size and terms of implementation. Allocation of the priority directions means that under certain economic conditions an opportunity arises for a bigger resource to be directed to all-social development without prejudice to investment innovative development, or at the need to activate the later, to increase resource provided in this direction [8].

Certainly, the solution of such complex problem demands studying of opportunities of use of system approach to it and, therefore, in the corresponding organizational form — the social and economic system and its subsystems or separate independent systems operating in interrelation.

One of the most successful general determinations of system is its consideration as an object where elements are in such degree of unity and at the same time mobility, that change of one of them leads to change of all other elements, thus, the system can be considered from the point of view of the processes arranged in it.

By S. A. Heynman's determination the system is something bigger, than the simple amount of the elements corresponding to it. Each particular system is a component — a subsystem of another, more extensive system, and these subsystems are interconnected, interdependent and interacting. However S. Heynman notes, and it, undoubtedly, it is necessary to recognize it as correct statement that «all subsystems which are parts of the whole system, do not form this whole by themselves yet». The concept of whole is connected with categories «structure» and «organization». They turn the isolated parts of a system into the functioning, operating mechanism. It is necessary to recognize as successful the definitions given by S. Heynman to structure and the organization. According to S. Heynman, the structure characterizes the internal device of a system, its structure — the subsystems of different levels and a part forming it — interdependence and subordination of the parts making it, their functional and linear communications. The organization is considered as the process providing by means of reception of impulses of functioning system with a structure inherent in it [9]. The organization provides communication of system on an entrance and exit with the outside world, supports system in a condition of functioning according to the tasks facing her. It is possible to add it, proceeding from the theory of a statics and dynamics. So, if to consider aspiration of systems for improvement and development, the organization is represented by a category more static, than dynamic. According to J. Schumpeter [10], the statics is connected with preserving of tradition which as we understand, is meant as creation of behavior model of a system, for example, by means of planning. Dynamic is understood as the activity providing on the set model behavior of system, the course of the processes supporting a steady condition, improvement and development of the system capable to adapt to the changing conditions.

It is necessary to specify that «organization» according to J. Schumpeter has a little wider meaning than a process providing functioning of a system within non-flexible structure. The organization and structure of a system are understood by him as the high-dynamic categories which are quickly reacting to changes and directed to progress, in other words it is possible to recognize only such structured organized activity as a system, and her institutional creation which is provided with necessary number of the institutes integrated by the general purpose and communications between them — system.

As shown above, according to macroeconomic measures, the investment and innovation processes are directly interconnected with the general progress of society represented by its

different types. These interrelations include tens of state institutes, hundreds of accounting entities, thousands of processes happening in them with a set of various output results [11].

The system of the most difficult relations is made of main participants, which are the state as system and accounting entities as its subsystems. The status of accounting entities as subsystems does not mean that in interrelations with the state have ridged dependence on it. In the investment and innovation processes it is not about dependence, but about relationship of the partners shown in compliance with their requirements which are satisfied by both parties.

The innovation-active accounting entities acting as subsystems of the state system in market conditions manifest themselves as self-governed purposeful subsystems, each of which, depending on internal requirements, aims to achieve the goal. So, at a certain temporary stage the most important purpose of one subsystem may be ensuring of viability and technical development. At the same time, another subsystem considers collective development, promoting further solution of a problem of economic growth to be its priority purpose. In parallel with these processes performed by accounting entities, the state solves a target problem of social progress in general.

As well as in a case with distribution of added value, the multi-vector problems allowing contradictions in the relations between the state and accounting entities are also solved. However, without denying the possibility of contradictions of private character, they need not to be allowed they took form of antagonisms which cannot be solved.

In market economy it is impossible for the state system and its subsystems to set specific purposes of the same importance of order and scale. It can not be done because any purpose is set and implemented not randomly, and proceeding from the opportunities of system and subsystems determined by the level of technology, economic, social development and it is difficult to provide that even two subsystems would have identical level of development. Subsystems can be such as: developing, providing the simple functioning; with lower level of development, being in a stage of financial recovery or on a verge of bankruptcy; level of bankrupt subsystems. Subsystems on the level of technical and technology and economic development are not identical. Therefore, it is impossible to bring their current activity under one common goal.

It is necessary to remember that, solving the current problems, in strategic aspect of a subsystem aim at development and to some extent provide these achievement of a common goal of system as through development of separate subsystems, the whole system is improved and develops. Even bankruptcy allowing to free the market from the systems interfering with the development of other more safe systems plays a positive role.

Thus, in all that it is connected with investment innovative development, beginning with income distribution and before determination with what institutions, what tools to perform it, and to provide maximum efficiency of influence of its results on acceleration of social progress, the system is traced.

Scale and the nature of these processes lift their perspective to the level of the state value. Therefore this problem has to be solved not by local measures even of large-scale enterprises, and with the most active participation of the state.

Any of the macroeconomic theories reflecting the methodology-conceptual maintenance of neoclassical, Keynesian, monetarist schools do not deny importance of participation of the state in difficult social and economic processes (irrespective of stage of development of economy itself) [12]. This is not denied and for market economy. This participation is possible without violation of patterns and principles of functioning of the market, by means of accomplishment of macro regulation function by the state. The need for macro regulation of the difficult phenomena to which it is completely possible to refer the investment and innovation processes is recognized by many scientists, in particular V. Geets, A. Amosha, B. Burkinsky. According to the economic theory, generally this function of the state comes down to accomplishment of the following tasks [13—15]:

- minimization of negative manifestations and their effects for economic systems;
- to creation legal, financial, social, etc. premises of effective functioning of economic systems.

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With regard to this, in a methodological aspect of development of model of macro regulation of the investment and innovation activity, which would incorporate theories of innovation and investment development, state regulation of market economy, statics, dynamics, the systems and complex analysis is of importance.

The conceptual and methodological model of the mechanism of macro regulation of the investment and innovation and the processes interconnected with them are provided in *Fig. 3*.

According to this model, the state can build regulation of the social and economic relations so that in the area of its attention any combination of subsystems and their actions accepted for the purpose and requirements capable to provide synergy positive result of innovation and investment and general social development will occur. From here arises the need for assessment of this result and the possibility of receiving it in the form of the integrated indicator.

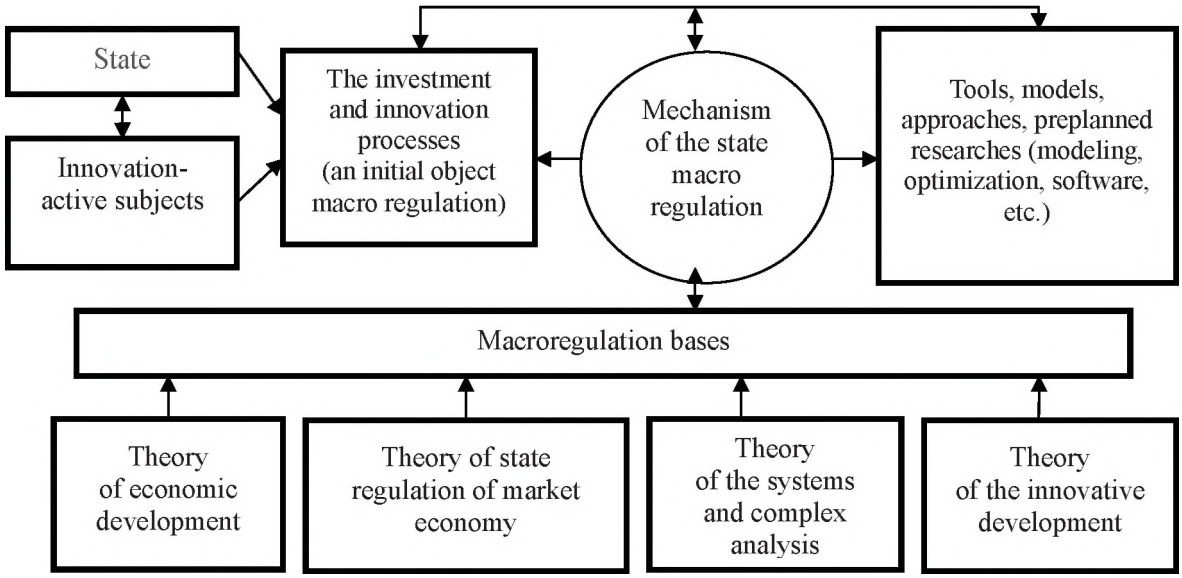

Fig. 3. **Conceptual model of macro regulation of the investment and innovation processes**

Source: created by the authors based on [8].

Conclusions and prospects for further research. Different indicators of level of development, for example indicators of a gross product, size of an economic resource, dynamics of growth of indicators find reflection in the theory of economic growth. However it is possible_to judge about a social state only indirectly by such indicators, and it often gives the distorted idea of level of actually achieved result. Therefore, the indicators listed and the ones similar to them are not completely suitable under criterion of efficiency for this case of a synergy indicator. High volumes of a gross product can be combined with poverty of the population the high material potential of the state is incommensurable to increase a real income of members of society and not promoting their growth of educational and common cultural level.

The investment and innovation processes provide creation of actual material and universal values which in such combination, are interpreted by the economic theory as the values defining quality of life. And modern theory more and more considers the life quality level indicator in particular competing with other indicators of development. The whole sphere of life of a person consisting of economic, scientific and technology, innovation, cultural, educational, health, ecological and other spheres is reflected in this indicator. The result is defined by achieved quality of life. In essence, the evaluation of the level of quality of life should be based on the sum of the changes that has happened and the actions which those changes turned into positive result, including actions for macro regulation. In general, everything stated in methodological and practical aspects points towards rational and effective creation of social and economic relations allowing to create corresponding wellbeing of the population.

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