

## **METHODOLOGY OF INVESTMENT CYCLE ANALYSIS IN THE REGIONAL ECONOMY: TERRITORIAL AND INDUSTRIAL ASPECTS**

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### **Abstract**

The paper gives a brief description of the recurrent approach to the study of modern macroeconomic processes. It defines the role of investment processes in the modern macroeconomic cycle. The authors' interpretation of the investment cycle as a structural component of progressive macroeconomic development is characterized by repeatability in time (periodicity); sequential change of stages; the presence of recurrent dependencies, determination character (determines the current basic trends). The justification of the investment cycle features on the basis of the recurrent approach made it possible to determine the features of the statistical analysis of the current investment cycle within the framework of the modern macrocycle. Such an analysis is a multi-level and multi-spectral study of the dynamics of investment activity indicators in the regional economy. It is based on a process approach that involves the systematization of relevant indicators and their phase-by-phase characteristics, including the territorial aspect of the study, which allows to identify general and particular dependencies within investment processes in each group of regions and/or in a specific region, as well as the sectoral aspect of the study, aimed at assessing the quality and efficiency of investment in the economy of the region on the basis of comparison of dynamics of real investment in foreign trade. A variety of different approaches and aspects of statistical analysis can contribute to a comprehensive study of the features of the current investment cycle.

**Keywords:** Macroeconomic cycle, recurrent approach, investment cycle, process approach

**JEL classification:** D51

### **1. Introduction**

The processes taking place in the economic systems of different levels at the present stage do not have an unambiguous interpretation. Many authors note the systemic nature of the crisis, objectivity and regularity, which are determined by changes in the essential principles of the functioning of the economy (Sushkova, 2017). In general, researchers note the accumulation of negative trends in all areas: serious problems arose in the real sector of the economy, in the financial sector, exacerbating the industrial recession, disrupting technological and investment processes, which became the basis for the formation of a "cumulative loop", indicating the closure of negative (regressive) trends in economics. At the same time, low investment activity makes technological modernization, contributing to the growth of productivity and efficiency of social production, almost impossible, as a consequence it leads to a decrease in social and political tensions in society.

Such "cumulative loops" are not a unique characteristic of only the current stage of the development of the economy, they were particularly clearly observed throughout the twentieth century, forming the basis for protracted deep structural crises (the crisis of the

1920s and 1930s, the crisis of the 1970s in the XX century). Their systematic, scale and duration contributed to a surge of scientific and applied interest in the problems of cyclicity: the emergence of new approaches to its analysis, contributed to the development of effective anti-crisis policies implemented in different countries at different stages with varying degrees of effectiveness.

A special place in such policies due to its providing nature was occupied by investment regulation. At the same time, direct state participation in investment processes is seen as compensating participation: with a decrease in investment activity of the private sector, direct public investment begins to play the role of an "accelerator" (A. Attalio) of economic progressive dynamics that forms an animating multiplier effect. At the same time, issues related to the study of general directions of investment regulation and its impact on economic processes were widely discussed by the scientific community. Thus, R. Frisch considered it important to provide the state with a progressive dynamic relationship between primary investment and reinvestment, which causes the effect of acceleration. P. Samuelson explored the peculiarities of investment by the role of the multiplier and accelerator, taking into account the delay and slowing down of the revitalizing effect of investments. R. Solow singled out the dependencies between the constant rates of increase in investment activity that provides economic growth, and the increase in the savings share of households. F. Modigliani in his developed model has proved the existence of regular relationships between the formation of personal savings and changes in income levels as a result of the difference between desired and real consumption. At the same time, the activation of fiscal policy to regulate the level of profit, which can become a basis for overcoming crisis trends, could become the source for increasing the pace of investment activity and eliminating structural imbalances and imbalances in industrial production. G. Tobin, J. Debre, G. Markovitz, U. Sharp, D. North, G. Bekker, R. Lukas, B. Ulin emphasized the importance of regulation of supply and demand in the financial market, and M. Fridman determined the priority of financial regulation to ensure a high level of investment activity of all participants (Kazakova, 2008).

Based on the presented provisions, it can be argued that the investment component is a catalyst for economic development and provides technological, innovative, and industrial progress. The quality (efficiency) and quantity (availability and accessibility) of investment resources determine the overall rhythm, duration and amplitude of the respective cycles and simultaneously obey their general rhythm.

Investigations of the problems of managing investment processes in systems of different levels, in spite of their multiplicity, have a number of limitations: there is insufficient theoretical and methodological justification for the interdependence between cycles within a modern macrocycle; there is no uniform interpretation of the concept of "investment cycle" and the methodology of its analysis with increasing relevance of the assessment of the current state and forecasting the development of investment processes, determining the direction and methods of managing investment cycles in systems at different levels. Proceeding from this, the purpose of this work is to develop a methodology for analyzing the current investment cycle within the current macrocycle in the region's economy. This goal required the following tasks: to identify features of the modern macroeconomic cycle; to develop a general algorithm with a subsequent step-by-step characterization of the investment cycle analysis in the regional economy on the basis of a combination of the territorial and sectoral aspects of the analysis.

## **2. Methods of research**

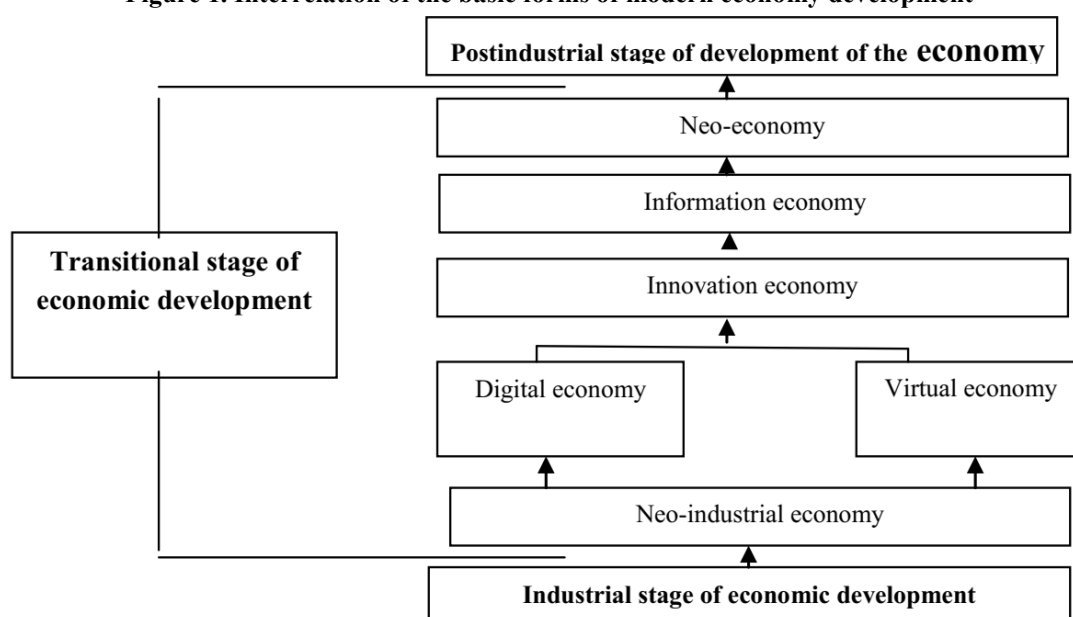
Modern macroeconomic processes, which are characterized by the predominance of regressive trends in all spheres of social development, have actualized the solution of existed problems related to the investigation of the essence, cause-effect dependencies, amplitude, depth and scale of the current crisis by domestic and world science.

A definitive analysis of the most common interpretations of modern economic development presented in the works of domestic and foreign authors, such as: innovation economy (Levin, 2008; Markevich & Fomina, 2014), information economy (Levin, 2008; Mirolyubova, 2012; Nobel laureates of the twentieth century, 2001), the neo-industrial economy (Kazakova, 2006; Pakhomova & Tkachenko, 2014; The Perm region, 2016), the digital economy and the virtual economy (Peres, 2011; Porubova, 2015, Porubova, 2014),

the neo-economy (*Alekseev et.al., 2012; Butorina, 2016; Gitman & Jank, 1997; Pakhomova & Tkachenko, 2014; Sibirskaya et.al., 2017; Sushkova, 2017; Baranichev, et.al., 2011*) was carried out to identify its distinctive features. They fully reflect the nature of modern macroeconomic development. At the same time, each researcher focuses on identifying the distinctive characteristics, without affecting the issues of their interconnection and interdependence, identifying the integrating process that forms the general vector of modern macroeconomic development.

The summarizing Table 1 identifies the types of economy, presents their definitions, systematizes the distinctive features, identifies targets that reflect the effectiveness of each type of economy. The creation of this table was subordinated to a specific goal - to identify the basic processes that reflect the nature of modern macroeconomic processes, and to determine their interrelationships. When the goal is changed, the table can be supplemented by the signs of comparison, and by types of economy. Based on the generalizing table, the authors made a number of principal conclusions. First, that the types of economy can be considered as stages of modern macroeconomic development (Figure 1).

**Figure 1. Interrelation of the basic forms of modern economy development**



The dependencies depicted in Fig. 1 reflect the essence of the present stage of development. It has a transitional character from the industrial to the postindustrial stage of the public in general and economic development in particular. In this case, the transition period is not homogeneous, it is a complex of intra-stage transitions from industrial to neo-industrial, from neo-industrial to information, from information to neo-economics, which can be viewed in accordance with the characteristics as the initial stage of the post-industrial development.

**Table 1 - Comparisons of interpretations of the main types of the economy at the current stage of development**

Distinctive features	Dominated process, transformations	Targets	Quantitative assessment parameters
The digital economy is "a system of economic, social, cultural relations based on the use of information and communication technologies" [6; 10; 14]			
-high level of automation; -electronic document management; -electronic accounting systems; -electronic data warehouses; -use of GRM; -creation of corporate social networks;	-digitalization; -computerization as the initial stage of digitalization	-creating innovations; -increasing competitiveness; -increase in labor productivity; -cost reduction;	-the number of people connected to the Internet; - the share of the IT segment in the country's GNP; -volumes of

<b>Distinctive features</b>	<b>Dominated process, transformations</b>	<b>Targets</b>	<b>Quantitative assessment parameters</b>
-use of ICT in production, management, communication, entertainment; -electronic payment systems in the framework of electronic commerce.		-creating new business models, new markets, new products; -improving the quality of life; -creating new sources of income.	electronic commerce; -IT companies ahead of market capitalization indicators; -volumes of electronic payments
The virtual economy is the "stage of the development of the information society", the stage of development of the information economy, the result of the scientific and technological revolution of the second half of the 20th century, connecting the genius of the human mind and the passion for profit "(V.F. Paulman) (end of 90s XX century) [7; 11]			
- modeling of real life and economy on the basis of on-line games; - formation and development of the virtual stock market; -part of the monetary circulation acquires forms of fictitious capital; -formation of a new on-line sector; -the emergence and development of electronic commerce both by real and virtual goods; -formation of information thinking; -prevalence of services	-virtualization of society and the economy as a whole (virtual economy replaces part of the already established economy)	-satisfaction of virtual needs	System of organizational features: -globalization of resource, commodity, stock markets; -unified management culture based on international holdings and TNCs
Information economy is a modern stage of civilizational development, characterized by the predominant role of normative products and creative work (M. Porat, 1976, M. Castells)			
-an economy based on R & D; -formation of the monetary and information form of capital; -increasing the share of intellectual property; - formation of a single human capital with a high share of professional intellectual property; -commercialization and socialization of information; -individualization of the labor market; -structural changes in production based on implementation of information processes; -formation of a global management system	informatization of society and economy	-formation of a new economy, focused on knowledge, extracted from information; -accelerating the pace of economic development in a geometric progression	- volumes of electronic commerce; - volumes of remote banking services; - volumes of remote exchange services; - volumes of electronic transactions
Neo-industrial economy – type of economy, which is peculiar to the new stage of industrial economy development			
-based on the new knowledge and innovations created in the country, not borrowed from other countries, connected with the creation of new critical branches of economy; -increase the share of state participation in financing corporate research and development	-a high-tech technotronic industrialization of the economy; -comprehensive updating and transformation of productive forces on the basis of breakthrough technologies	-growth of country's competitiveness based on using innovation technologies; -growth of labor productivity; -growth of social and economic effectiveness of national production	- investments in R&D; -research development rate; -innovation clusters; -state programs for R&D implementation in priority fields
Innovative economy is a type of economy based on the flow of innovations, on constant technological improvement, on the production and export of high-tech products with high added value and the			

<b>Distinctive features</b>	<b>Dominated process, transformations</b>	<b>Targets</b>	<b>Quantitative assessment parameters</b>
<b>technologies themselves</b>			
- mass generation of innovations; -venturization of business; -high level of education and science development, -domination of 4-6 technological order; -constant increase of innovation efficiency on the basis of their excess and growing level of competition; -formation of the developed knowledge industry and their export; -a constant stream of borrowed and self-created innovations	-innovatization of the economy and society in general	-growth of the country's competitiveness-life quality growth; -rowth of value and quality of human capital, its stable acumulation	-innovative enterprises share; -innovative products share; -economic freedom index
<b>Post-industrial economy – economy of the post-industrial society</b>			
- priority of production of services; -information becomes the main production resource; -profit is formed mainly not in production, but in intellectual and managerial activities; -strengthening the role and importance of the human factor; -formation of a new type of business -venture business	-servicization of production (creation of tertiary sector of the economy); -"transition to a knowledge society"	-substantial growth in income; -significant increase in the quality of life	-50% of the country's GDP is created in the service sector
<b>Neo-economy is an economy based on the application of information to the generation of knowledge; it is a dynamically developing internationalized system of economic relations based on ICT, network models of management of the processes occurring in it [20]</b>			
-information becomes an independent resource; -informatization and IT-sector become a generator of development; - informational social wealth; - completion of the formation of a global society; -virtualization of economic processes; - multiplying of human capital; -quantitative and qualitative leap of TNC development	-informatization, generation of knowledge and innovations, forming a "cumulative loop" of feedback between innovations and directions of their use	-significant revenue growth; -significant growth of life quality	

Distinctive features of each type of modern economy allow us to identify the basic processes of the transition stage as a whole, as well as to identify their interrelations. The basic authors include processes that have a nonlinear character of development and thus form the basis of the cyclical development:

- informatization as a process of formation, dissemination, commercialization of new knowledge embodied in material and material means and objects of labor, having accumulative character, transforming social production, and also ensuring the formation and dissemination of innovative and technological progress (information cycle);

- structural transformation, involving structural changes in production and the economy as a whole, based on the creation and implementation of information processes, the emergence of new critical industries (structural cycle);

- innovation as a process of mass generation of innovations, constant increase of their efficiency on the basis of excess and growing level of competition in the innovation environment in the domestic and foreign markets (innovation cycle);

- significant changes in labor resources, involving the qualitative growth of human capital with a high share of professional intellectual property on the basis of commercialization and industrialization of knowledge (social cycle);
- “servicization” of production (production cycle);
- knowledge-intensive and technotronic improvement of production technologies, constant updating and transformation of productive forces on the basis of breakthrough technologies (technological cycle);
- search and introduction of new forms of investment support for economic development (investment cycle).

Dedicated processes, as it seems to us, are characterized by direct and inverse relationships. Thus, in modern conditions and throughout the transition phase, information becomes a universal productive force, and scientific research is the basic factor of the production process, forming the so-called "Zero cycle". The commercialization of scientific information in the means of production that change the content, nature, conditions and functions of labor presupposes significant shifts in production technologies (the technological cycle), which is impossible without innovative transformations (the innovation cycle) and free capital flow (investment cycle). Under the influence of these processes, the efficiency of material production increases, manifested in the growth of labor and capital productivity, in reducing the time of the production cycle, in optimizing production costs. The nonlinear nature of change determines the direction of structural shifts (structural cycle) and forms the vector of the individual's development (social cycle).

The processes described above are universally recognized as having a cyclic nature, which we consider as an objective form of development of economic phenomena and processes, of systems at different levels and its structural components.

Based on the above, modern macroeconomic processes represent a transitional stage from the industrial to the postindustrial stage of social development in general and economic development in particular, characterized by universal informatization, structural transformation, innovation, labor capitalization, production services, science intensive and technotronic renewal and transformation of productive forces, the introduction of new forms of investment support for economic development, directed on systemic transformation (changing not only the shape but also the very essence of the system), which has the objective cyclic nature.

Proceeding from that, the modern macroeconomic cycle is a special kind of cycle that has a transformational character, within the framework of which the information cycle as an independent kind of cycle can be viewed as a conjunctural cycle, where technological, innovation and investment cycles overlap it and have a supporting character, a production cycle is a characterizing cycle, social and structural cycles are the resultant ones.

In accordance with the essence of cyclicity as a form of development, it has: 1) its own time duration, 2) successive change of states (phases); 3) interphase and intercycle recurrence, determined by its accumulating nature.

Within the framework of the stated goal of this article, the greatest attention will be paid to the investment component of the modern macroeconomic cycle, which also has a cyclic nature. However, the very concept of the investment cycle in modern theory is poorly researched.

Interpretation of the concept of the cycle and the scope of its use in foreign publications is wide: it is used by portfolio investors, managers of investment funds and consulting organizations, securities market dealers and other structures. Russian scientists are trying to form an idea of the nature and content of the concept of the investment cycle, relying on the structure of the dynamic series ("phases", "stages", "operations", etc.) (*Markevich S.V. & Fomina, 2014, p 5,13,150*); *Levin, 2008*; *Mirolubova, 2012*; *Porubova, 2014*; *Porubova, 2015*; *Sibirskaya et. al. 2017*). Most often, researchers consider the cyclical nature of investment activity in relation to the enterprise's economy (within the framework of investment design).

To determine the character of the investment cycle it is purposeful to use recurrent approach, the essence of which could be stated as a multilevel, multifactorial and multicriterial characteristic of the specific relations and specific dependencies between different cycles and stages. Key issues of the recurrent approach are studied rather thoroughly

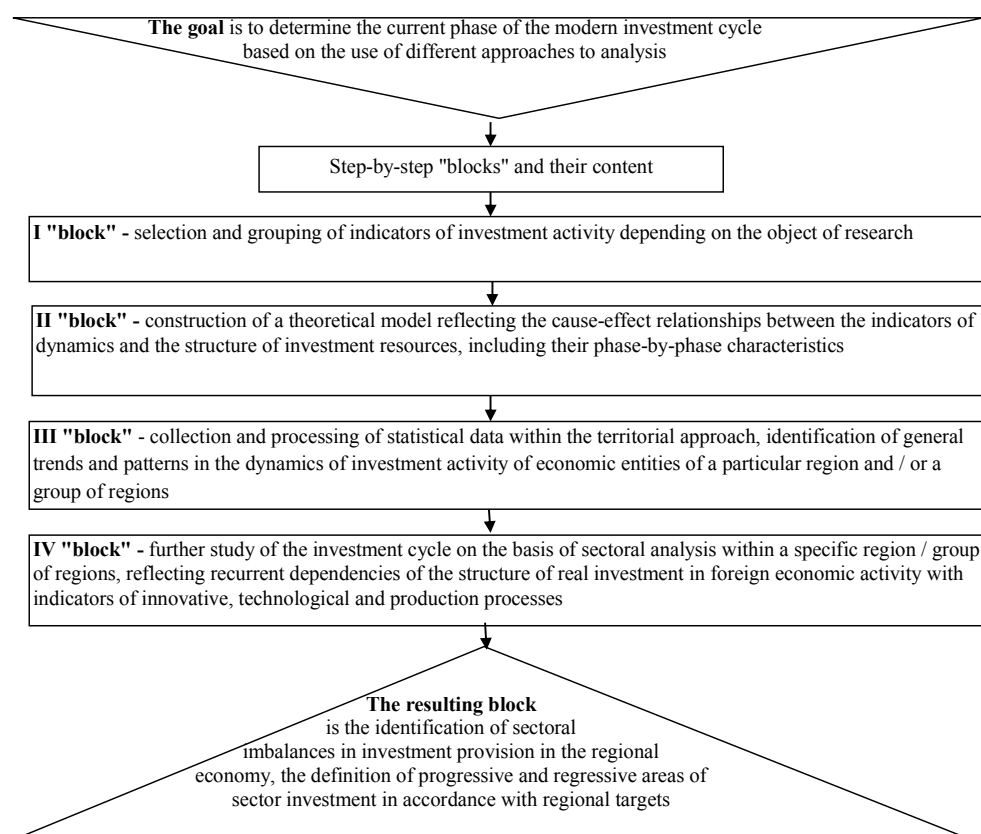
in works (Butorina, 2016; Butorina & Osipova, 2015) and others. In conjunction with the basic principles of recurrent approach investment cycle can be determined as a structural component of the modern macroeconomic cycle, manifested in fluctuations of tendencies over a certain periods of time, reflecting investment activity in systems of different levels, where its providing character determines its basic trends. It is characterized by: intrinsic recurrence in time (periodicity); sequential change of states; recurrent dependencies with information, innovation, technological, production, social and structural processes.

### 3. Interpretation and analysis of research results

Dedicated features of the investment cycle, as it seems to us, should be taken into account when developing a general algorithm for the analysis of investment processes in the regional economy (the second of the tasks set). In its most general form, it is presented in Fig. 2.

Let's analyze each of the presented blocks of the general algorithm of the methodology for analysis of investment processes in the regional economy. The purpose of the analysis is to determine the current phase of the modern investment cycle based on the use of different approaches to research.

**Figure 2. A general algorithm for developing a methodology for analyzing the current investment cycle**



The 1<sup>st</sup> and 2<sup>nd</sup> "blocks" have a theoretical and methodological basis, they are related to the choice and systematization of indicators. To identify the features of the investment cycle, we consider it expedient to use the capital structure proposed by K. Perez (2011). In her opinion, the process of real creation of wealth presupposes the division of capital into two main types: the so-called "productive capital", which combines the behavior of agents that create new wealth through the production of goods and services, realizing the ability to profit through investment in innovation and expansion of capacity. The second type of capital is based on the ability in general or a specific mechanism for ensuring the realization of productive capital by its basic functions. Financial capital (the essence of the second type of capital) combines the behavior of agents who possess wealth in the form of money and all their behavior is

somehow reduced to obtaining and increasing their monetary wealth, thereby affecting the possibilities of the process of real wealth creation and the final distribution of financial resources in economic systems, including in the regional economy.

It should be especially noted that these indicators: 1) are designed to reflect the general trends in the investment process as a whole; 2) are weakly related to the available statistical base, therefore they require appropriate specification; 3) do not allow to determine the phase within the framework of the modern investment cycle.

In this case, according to Kazakova N.A. analysis of investment processes in the region's economy should also include the study of real investment (investment in fixed assets) and investment in intangible assets, while at the present stage the first directions of investment are priority ones (Kazakova, 2006; Kazakova, 2008).

A theoretical model has been constructed taking into account the specific features of investment processes in the economy of the region. The indicators of the investment cycle are systematized in it, taking into account the interfacial recurrence as an objective dependence of the flow of each phase from the previous one and the formation of the prerequisites for the subsequent one (Table 2). Their phase-by-phase characteristics are differentially represented for each of the selected indicators on the basis of it, in other words, in each phase, the basic directions of indicator dynamics were determined on the basis of generalizations of modern theory and practice of macroeconomic cyclic processes management in general and investment development in particular.

**Table 2 The phase characterization of the indicators of the current investment cycle**

<b>Indicators</b>	<b>Crisis</b>	<b>Depression</b>	<b>Revitalization</b>	<b>Rise</b>
<b>I group of indicators characterizing industrial investment</b>				
Investments in fixed assets, mln rub	steadily declining	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily increasing
Investments in fixed assets of Russian investors, mln rub	steadily declining	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily increasing
State national investments in fixed assets, mln rub	steadily declining	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily increasing
Private national investment in fixed assets, mln. rub.	steadily declining	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily increasing
Mixed national investments in fixed assets, mln. rub.	steadily declining	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily increasing
Investments in fixed capital of foreign investors, mln. rub.	steadily declining	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily increasing
Joint investments in fixed assets of foreign and Russian investors, mln. rub.	steadily declining	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily increasing
<b>II group of indicators that form the dynamics of industrial investment</b>				
Investments in fixed assets due to own funds, mln. rub.	steadily declining	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily increasing
Investments in fixed assets due to borrowed funds, mln. rub.	steadily declining	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily increasing
Attracted investments due to bank loans, mln. rub.	steadily declining	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily increasing
Attracted investments due to borrowed funds of other organizations, mln rub.	steadily declining	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily increasing



<b>Indicators</b>	<b>Crisis</b>	<b>Depression</b>	<b>Revitalization</b>	<b>Rise</b>
Attracted investments from budgetary funds, mln. rub.	steadily declining	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily increasing
Financial investments of organizations (millions of rubles), total	steadily declining	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily increasing
Balanced financial result (profit minus loss) of organizations' activities, mln. Rub.	steadily declining	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily increasing
Amortization funds, mln rub	steadily decline	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily increasing
Total debt of organizations for liabilities, mln. rub.	steadily increases	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily declining
Debt of organizations on loans to banks, mln rub.	steadily increases	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily declining
Offer loans	steadily declining	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily increasing
Interest rate	steadily increases	uneven increase while maintaining negative trends	uneven increase while maintaining positive trends	steadily declining

(Source: The Perm region. A brief statistical compilation. 2016)

The proposed indicators are conditionally divided into the corresponding groups: the first group includes indicators that directly characterize industrial investment; the second group consists of the indicators that form the investment activity in the region.

This systematization of indicators can be used to assess the current level of investment activity of economic systems at different levels, primarily regional ones.

The proposed methodology for analyzing the current investment cycle assumes: 1) the complexity of the analysis; 2) the objectivity and accessibility of the statistical base used, reflected in official statistical yearbooks, as well as in specialized information sites; 3) use of the process approach, which allows considering the investment cycle of the economy as a dynamic process.

At the same time, the essence of the process approach to statistical analysis can be defined by us as a specific approach to the analysis of phenomena and processes based on the identification of numerous relationships, their identification and interdependence at the interface of individual processes within their system, as well as their combination and interaction at higher levels of economic systems. Therefore, it involves the allocation of groups of indicators related to each other, focusing on the nature of their recurrence links, the study of indicators in the dynamics of absolute values to determine the current phase of the cycle.

Based on the existing dependencies between indicators described in the literature that reflect the essence of investing in the economy of the region, priority ones can be singled out, i.e. those that fully describe the investment activity of economic entities.

It seems to us that such indicators as investing in fixed assets of Russian investors, state national investments in fixed assets, private national investments in fixed assets, mixed national investments in fixed assets, investments in fixed capital of foreign investors reflect not only the overall level of investment activity, but also give an idea of the importance of each participant in the investment process (organizations, public authorities, foreign investors).

In this case, as it is noted by Alekseev, Fomina, Markevich (2012) among the subjects of investment at the present stage, the crucial importance is acquired by firms as owners of the financial resources formed and accumulated in various budgets and funds of organizations

(depreciation, accumulation, etc.), by the state implementing all types and forms of public financing, including the formation of infrastructure, federal targeted programs, tax (etc.) benefits, direct financing, and investment funds, by investors placing funds in assets on formal criteria for financial efficiency (equity, securities, etc.), by the banks and credit institutions that offer financial resources for liquid collateral (low financing risks) or secured third-party liabilities with relatively low margin profitability, by the venture funds that invest funds in innovative and risky projects not secured by liquid assets (high financing risks) with the prospect of superprofits, as well as by the special funds providing basis for development of ideas and results of R & D, transfer of technologies in the pre-investment phase of projects (Alekseev et. al., 2012, *The Perm region. A brief statistical compilation.*, 2016).

Therefore, the following indicators, such as investments in fixed assets from own funds, investments in fixed assets due to borrowed funds, attracted investments from bank loans, attracted investments from borrowed funds of other organizations, attracted investments from budget funds, balanced financial the result (profit minus loss) of organizations' activities, depreciation funds as indicators can fully reflect the ability of enterprises and organizations to build up investment component activity, and to identify the priorities in the formation and attraction of investment resources. According to Rastvortseva (2017) Russia's regions have the largest degree of concentration by index of fixed capital expenditures.

Such indicators as the total debt of organizations for liabilities, arrears of organizations on bank loans and loans, can fully characterize the general conditions and possibilities for raising funds, so they have a formative character.

To the same formative indicators, the indicators of the second group can be assigned, which allow estimating the financial capital available in the country as the foundation for the formation of real investments. Reserves of commercial banks, the supply of loans and their value may indicate the availability of investment resources, the possibility of their involvement by enterprises and organizations.

The 3<sup>rd</sup> "block" of the algorithm for analysis of the investment cycle is analytical one. It involves the collection and processing of statistical data. The most significant for this stage of the investment cycle study is the territorial aspect of the study.

As it seems to us, the comparison of the indicators selected in the theoretical model at the level of the subjects of the Russian Federation will allow:

- to reveal territorial differences in investment activity of economic entities;
- to unite the regions into groups: the first group - the regions in which regressive trends predominate (by the number of indicators in the phases of crisis and depression), the second group - the regions in which progressive trends predominate (by the number of indicators in the phases of recovery and recovery);
- to determine the general trends for each group of the region, then for each region in the group;
- to highlight the particular features of the investment process on the basis of an analysis of the cause-effect relationships between the first group of indicators that characterize industrial investment and the second group that form the dynamics of industrial investment.

The 4<sup>th</sup> "block" implies further exploration of the investment cycle within a specific group of regions and / or a specific territorial unit based on industry analysis. In its framework, we consider it expedient to study in more depth the interrelationships between the dynamics of real investments in foreign economic activity (with a similar phase-by-phase characteristic) with indicators of innovative, technological and production processes in the region's economy. This aspect of the analysis also required the specification of the relevant indicators.

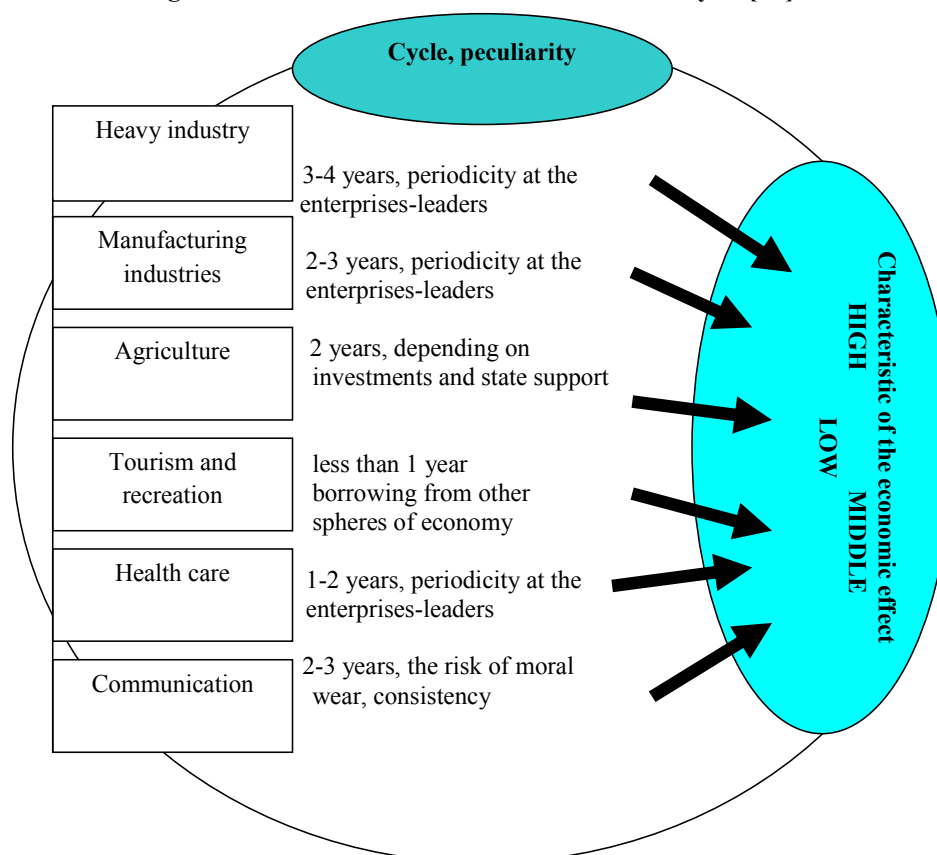
Let us consider how this concept can be realized by the example of regions with different economic specialization. Let's characterize features of an investment cycle on an example of various branches (Fig. 3).

The greatest effect and long terms of the investment cycle can be identified for the manufacturing industries and similar industries associated with material production.

Enterprises-leaders of the industry constantly invest in production in order to maintain market share, so in this case the problem of cyclicity is to identify the periodicity of the economic effect, assess the impact on the activities of the business entity in general, the industry. The duration of the effect is that the implemented innovations can be spread not only

at one enterprise, but also on the participants in the network, the industrial cluster, and can be borrowed by the related industries.

**Figure 3. Peculiarities of branches' investment cycle [17]**



Communication is one of the most dynamically developing industries, as there is a continuous process of increasing the quality of services and products aimed at the consumer. The investment process is associated with significant risks of obsolescence of investments in projects at various stages of investment. The problem of cyclicity in this case is directly related to strategic planning and optimization of resources, the choice of one or several lines of business in order to rationalize the activities of scientific and technical units.

The tourist and recreational sphere is characterized by the fact that innovations are mainly borrowed from related industries: communication, standards and service technologies in the hospitality industry. The obvious advantages are the absence of the need for significant financial resources, fast implementation speed at the enterprises of the industry – sometimes it equals to several months. The shortcomings include accessibility for copying by competitors, and therefore the economic effect is lower and short-term. At enterprises that provide specialized services for treatment and rehabilitation the investment cycle can also be quite long, because it is associated with new technologies of treatment, the introduction of diagnostic and medical equipment. In this case, the investment cycle in terms of parameters will coincide with the branches of material production. A significant difference is the problem of calculating the integrated economic effect, which will be the costs that consumers of services will produce in a certain territory, contributing to the development of transport, catering, leisure and entertainment (*Oborin et al., 2017*).

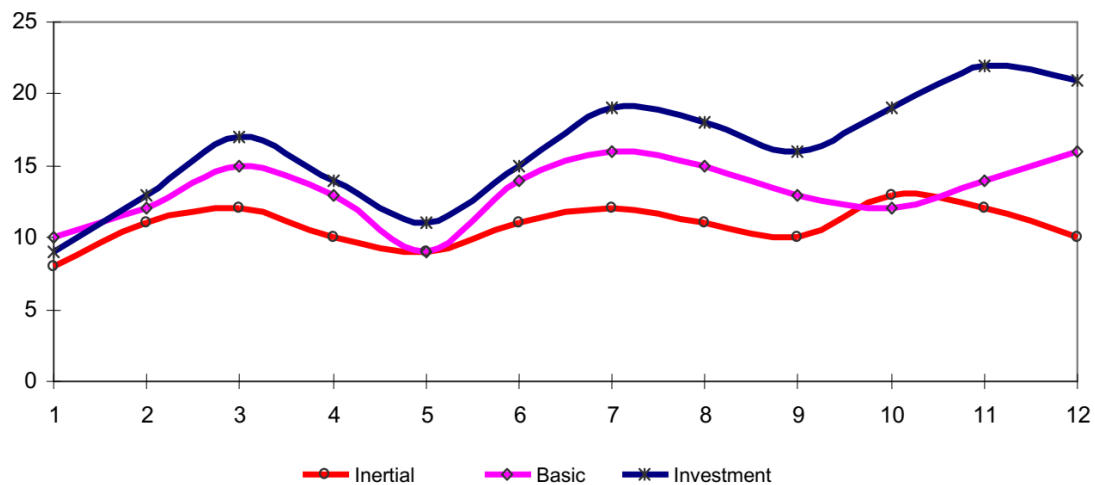
It should be borne in mind that the cyclicity of investments can be observed on the example of large enterprises: the leading enterprises of the industry or territory, therefore the system of indicators should take into account the specifics of the existing types of economic activity, the attractiveness of the territory for investment, the development strategy of the region, the state of the infrastructure of the main enterprises, social and economic tendencies of development, which can affect the investment cycle (outflow of population, high unemployment, the presence of depression production) (*Oborin et al., 2016*), the growth of

productivity causes labor reduction and consequently a fall in employment (*Cutrini & Enzo, 2017*).

The investment cycle implies economic feasibility, the effect for an enterprise or a group of enterprises, an increase in the performance of a business entity, industry, or region. For economically developed territories or regions with a high level of state support, the economic cycle is presented in the form of many projects with different completion times and efficiency (Fig. 4).

In order to simplify the initial level, the non-optimal use of the potential of the region was adopted, which allows increasing social and economic indicators on the basis of investment cycles. Despite the completion of the cycles, the investment scenario for regional development is a priority one, despite the risks.

**Figure 4. Model of investment cycle of regions with developed financial and economic potential**



As it was noted by many researchers (*Kazakova, 2008; Levin, 2008; Mirolyubova, 2012; Porubova, 2015*), the evaluation of the quality of capital investments and their effectiveness should be "tied" to real economic processes because of their supporting nature. In this case, the choice of the resulting indicators cannot be accidental. The recurrent dependencies of the investment cycle and innovative, technological and production processes described above determined the directions of the branch analysis (Table 3).

**Table 3 - The main directions of the branch analysis of the investment cycle**

Indicators of innovation processes	Indicators of technological processes	Indicators of production processes
- internal costs of organizations of the business sector for innovative research and development	- the average annual cost of productive fixed capital assets; - depreciation of productive fixed capital assets; - investments in buildings (except for residential buildings) and structures; - investments in machinery, equipment, vehicles	- gross output; - profitability of production

Sectoral comparisons of the dynamics of real investment with the final indicators of innovative, technological, production processes in the economy of the region, as it seems to us, will allow:

- to identify the recurrence of the investment cycle within the current macrocycle;
- to evaluate the quality and efficiency of investment;
- to identify sectoral imbalances in investment provision in the regional economy, identify progressive and regressive areas of sector investment in accordance with regional targets (the resulting algorithm unit).

#### **4. Conclusions**

Based on the research carried out, general conclusions can be drawn:

- "investment cycle" within the framework of the recurrent approach can be interpreted as a structural component of progressive macroeconomic development, characterized by: repeatability in time (periodicity); sequential change of states; the presence of recurrent dependencies, which provides the character of which is determined by current basic trends;

- statistical analysis of the current investment cycle within the framework of the modern macrocycle is a multi-level and multi-spectral study of the dynamics of investment activity indicators in the regional economy. Within the framework of the process approach it is the systematization of the respective indicators and their phase-by-phase characteristics; within the territorial aspect of the study, the identification of general and particular dependencies within investment processes in each group of regions and / or in a specific region, and the sectoral aspect of the study - assumes an assessment of quality and efficiency on the basis of a comparison of the dynamics of real investment in foreign economic activity with indicators characterizing innovative, technological, production processes in the economy of different territorial entities;

- a combination of different methods of statistical analysis will make it possible to conduct a comprehensive study of the features of the current investment cycle, the results of which can form the basis for the development of a common investment policy aimed at leveling the sectoral imbalances in the investment provision of the regional economy, identifying investment directions in accordance with regional targets.

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