Innovative leasing engineering as tool for synchronization of innovative, leasing and buying cycles

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Abstract. This article suggests a new principle of cyclic synchronization of innovative, leasing and buying cycles in construction "innovative leasing engineering" which facilitates the accelerated transition of the national economy to the innovative way of development. Cyclical nature of economic phenomena is not only their immanent property, but also the subject of economic analysis. Modern format of decision making management requires analysis of the many cycles which fill any kind of activity. Accounting and reconciliation of construction, design, investment, buying, reproduction, leasing and other cycles is important for investment and construction sphere from the point of view of necessity for synchronization and position of determining the nature of trends in sectoral development.

1. Introduction

In economic science, which studies patterns of economic phenomena, their wave character has been postulated for more than a century, and any micro-, meso- and macroeconomic system is explored as a flow of life cycles of products, services, systems, projects, etc. Whichever side of economic dynamics is studied at any hierarchical level, cyclic nature of phenomena and processes is traced in all cases. Repeated building cycle is operated by the process of construction products creation in construction. Its specificity predetermines the necessity of creation of project documentation, capital intensity and riskiness - the mandatory usage of competitive procedures, production specifics - expertise and author's supervision for construction progress, etc. In process of creation of the construction products, long-term and short-term, material and non-material, constant and periodic, production, consumer and other cycles arise and interact. In construction, particular attention is paid to the following types of cycles for research purposes: Construction, project, life cycle of real estate, investment, buying, reproduction, innovation, leasing, etc [1].

Analysis showed that in the practice of investment and construction activity there are three main types of development. Increasing intensity is inherent to the high level of cyclic synchronization. Degradation trend arises as a result of mismatched cycles. Stabilization character is inherent to the routine operations of maintenance of the established proportions and cyclic mutual compliance. Researches of cyclical nature of investment and construction processes is impossible without conception of their hierarchy. Principles of synchronization and subordination of cycles should be used not only for the construction of economically efficient systems, but for the development of the administrative tools. It is very important to understand that in addition to cyclical synchronization of external and internal parameters, resource provision, interests and goals of participants, it is extremely important to consider the structure and dynamics of needs for all types of the development. Coordination of manufacturing
and consumer sectors of the national economic performs on the institutional level, the goal of which is to maintain the competitiveness of the national economy, forestalling the possibility of conflict of economic interests preventively.

2. Materials and Methods

Duration of the stages of initiation, deployment, and extinction is different and depends primarily on the number of objective circumstances for developmental cycles of different qualities. Their evaluation is very important, but it is impossible without cyclical dynamics structuring. The fact that value of cycles in the target development trends ensuring is not identical follows from their functional characteristics, power, forms and methods of influence on results, extents of influence on activity of subjects, etc. Performed analysis revealed that complex product-oriented cycles have a basic character which predetermines parameters of derived cycles. For example, the construction cycle and its features predetermine technological, innovative and other cycles which ensure the realization of the material production processes. Buying and contract cycles provide its innovative direction, ultimately forming innovative cycles in construction. Usage of the methodological principle of cyclic subordination is absolutely imperative within scientific search for solutions of the existing contradictions in development. Their critical mass implies their systemic overdrive. As analysis shows, it is impossible to "freeze", even on the short time, or to ignore a contiguous or coordinated cycle without real losses and missed profit on all of the forming development trends. With other equal conditions, growth potential can be realized upon condition of systematized and synchronized actions of one and all economic subjects in the direction of realization of development goals. Forming many developmental cycles, activities of the subjects ultimately focuses on the form of investment cycles for the realization of projects which should bring a visible return which appears as a result of the increase of the living standards.

Let us consider the types of innovative cycles in construction which can be observed during the period of time, starting from the time when the idea of creation of the new building or structure appears and to the moment of liquidation of built and operated real estate object in connection with deterioration and abolishment. There are short, medium and long-term innovation cycles. Periodicity of short-term innovation cycles is 3-4 years. During this period of time, the models of equipment are being replaced, modification of technologies, which are used in construction on the basis of improving innovations are being modified.

Medium-term innovation cycles are observed every 9-11 years in construction. There is a change in the generations of equipment and technology in this period of time. Nearly after the ten years of operation of the building it can be overhauled, reconstructed or upgraded and modernized with the usage of more efficient generations of construction equipment, facilities, innovative building materials which were created on the basis of radical innovations. Development and dissemination is performed on the upward wave of innovation cycle. Gradually, there is a growing demand for basic innovations, on the basis of which new generations of machinery and technologies are created. This process is associated with an investment growth. Behind the wave of basic innovations, improving innovations which expand the assortment of new generations of machinery and technologies are formed. Incremental innovations contribute to the reclamation of new market niches. Then comes the stationary phase, market saturates with new products when innovations which improve separate parameters of the manufactured products and used technologies are realized mainly. Gradually, there is a decline in the innovation wave. Number of pseudo-innovations, which aimed at improvement of the old-fashioned in their basis generations of technologies and equipment is increasing and it leads to losses [2]. Innovative activity is being decreased: demand for basic innovations is falling, and the volume of investments is declining. Innovations which could provide early renewal of key assets are being rejected on this wave, because certain amount of time is required for return on investment for the key assets created on the basis of radical innovations. After investment are paid off and after a while these exploited key assets will cease to meet the public needs in connection with their moral and, partially, physical deterioration. New basic and improving innovations will be required for their innovative renovation which establish some
frameworks for further, more efficient generation of equipment and technologies. It is time for the next medium-term innovation cycle.

3. Results
Finance lease is applied for renewal of the key assets in construction, along with lending, buying in property, public financing, etc. in the world practice. Abroad, the frequency of leasing cycles is 6-8 years on average. For example, the duration of leasing cycles in the UK is about 6-8 years, in Japan is about 5 years, 5-6 years in Italy, 5-8 years in France [3]. Analysis showed that leasing cycles in foreign countries are close to the lower boundary of medium-term innovation cycles. As the practice of leasing business shows, and in accordance with the Internal Revenue Code of the Russian Federation, a considerable part of equipment and transport in Russia is being depreciated for four years, that is conditioned with the preferential regime of accelerated depreciation which is applied in our country. Duration of leasing cycles in Russia is 4 years on average. This periodicity is about 1-1.5 years shorter than in foreign countries with developed leasing relationships. At that it should be considered that the structure of leasing property can make a massive impact on the leasing cyclicality. If the share of property with long terms of depreciation increases in the total leasing portfolio, then the average duration of the cycle increases, and vice versa.

Application of leasing allows to accelerate the process of transfer of national economy on the innovative way of development in Russia. As showed results of the research in our country, payback period of investments in key assets at leasing is shorter than at lending, property acquisition for own expense, etc. Thus, leasing promotes the early renewal of key assets on the basis of improving and radical innovations which were rejected until the time of recoupment of investments at usage of the other financing sources. Leasing allows to exclude the "time lag" which forms with usage of other financing sources and during which innovation is not entering unto the process of economic development of the country until the investments are paid off.

At the expense of the application of leasing technologies, process of the new equipment renewal is accelerating because it is more productive and products of higher quality are produced with application of it, and it also better meets the public needs, that contributes to the growth of GDP in Russia, appearance of the new workplaces and development of the national economy. Dynamics and cyclic development of leasing are influenced by various factors which can act in different directions. For example, technological progress and innovations in the depreciation tax policy of the state can contribute to the reduction of the life span of property which is leased and periodicity of its renewal and the timing of the cycle. Another factor which influences the cyclical dynamics of leasing is the interest rate. If the leasing interest decreases, leasing becomes more attractive. Reduction of interest influences on the decreasing price for leasing service price. At growth of leasing interest, the amount of transactions per unit of time increases, because higher interest rates lead to higher prices. Increase in directed to the real sector of the economy capital occurs with development of the technical progress and new kinds of equipment are involved in leasing rotation. Investment of capital in key assets increases the demand for capital. The curve of this demand in its level, the further it is, the more it begins to approach the level of the accumulation curve and then exceed the last one. This gives rise to the tendency of increase of capital and to growth of interest on it [4]. Nowadays, mechanism of E-tenders (e-procurements) is the one of the effective tools to reduce the leasing interest and save money for the customer. As the results of foresight studies of specialists showed, the electronic form of procurements has a great prospect in the future. According to the data of the rating agencies, purchases in electronic form are used by only 60% of customers nowadays. When purchasing through electronic trading platforms (ETPs), they see them as an effective tool to reduce costs on the inventory and logistics management.

Application of electronic tenders in leasing relationship ensures a reduction of the interest rate on leasing and, as a result, a decrease in the cost of leasing, that contributes its attractiveness and further development. On the basis of the results of conducted researches, factors which adversely influence on the development of leasing in modern conditions should include the lack of experience in usage of e-procurement technology for leasing services among the most potential lessees and reluctance to change
existing stereotypes in relation to the traditional process of material and technical support of the organization, as many organizations prefer to work with their usual suppliers. Participation in trading on ETP encourages counterparties to reduce prices significantly. This effect is achieved precisely through deeper and organized competition of suppliers at performance of trades on ETP. Proof of this are numerous examples when, during the procurement of ETPs, significant reduction in the price under competitive conditions was performed by traditional suppliers, with which the customer had cooperated for many years. Competitive purchases of leasing services which are performed on ETP allow to significantly reduce the costs of the lessee company, but insufficient elaboration of the methodological base for electronic leasing purchases, the lack of specialists who have necessary competences to manage the procurement of leasing services in electronic form are a huge obstacle to the development of leasing and innovative development of organizations - potential lessees [5].

In Russia, one of the problems in engineering sphere which limit its development is the lack of effective organizational and economic mechanism for interaction of engineering companies with leasing and insurance companies, suppliers of high-tech equipment and modern equipment which allows to "catch" a wave of innovation for renovation of key assets in construction in time, including the projects on construction of complex industrial and infrastructure facilities, which are realizing on a turnkey basis within EPC (Engineering, Procurement and Construction) or EPCM (Engineering, Procurement and Construction Management) contracts. As the results of the study showed, EPC and EPCM contracts do not include leasing cycle management services. Nowadays, if such a contract provides the financing of a project with usage of leasing, then scheme of interaction between the lessor and the lessee remains classical. Leasing company is involved for financing of the necessary equipment or technologies. Leasing contract is concluded between the lessor and the lessee. EPC (M) contract expires after the delivery of the necessary equipment and the commissioning of the constructed facility and the engineering company does not have any liabilities associated with operation of the leased asset. Then, in accordance with the leasing agreement, leased asset is transferred to the lessee for usage and they are responsible for the timely performance of its maintenance and repair, and pays leasing payments. At the end of the leasing agreement, the leased asset becomes the property of the lessee [6].

4. Discussion

As a result of the researches, new tool for cyclical synchronization of innovative, leasing and purchasing cycles in construction was proposed. This is the "innovative leasing engineering" which was developed through the changing of the institutional structure of leasing, including such institutions as: institute of property, crediting, financial leasing, insurance, institute of electronic tenders, etc. and implementation of the institute of engineering in it (Fig. 1), and is a system of management of leasing cycle in construction at the macro, meso, and micro levels. It is proposed to perform management of the leasing cycle in construction at the micro level by specialized engineering companies:
- in the form of a set of services provided to the lessee, starting from the reception of an application on the necessity of purchase of the innovative equipment, technologies and other key assets to the complete depreciation of the leased asset from them. These services include: consultation in selection of the subject of leasing on the basis of research of technical and technological trends in construction, preparation and implementation of procurement procedures for leasing services in electronic form, assistance in the acceptance and transfer of the leased asset to the lessee, organization of its maintenance and repair, control of the leasing payments, assistance in the purchase of the leased asset after the termination of the lease agreement and simultaneous development of strategy of subsequent updates of the key assets of the lessee on the basis of new studies of technical and technological trends in construction;
Figure 1. Institutional scheme of the mechanism of innovative leasing engineering

-within the investment and construction project which is being realized on the conditions of the EPCM contract, starting from the moment of appearance of the idea of acquiring innovative equipment, machinery and other basic tools for realization of idea of this project arose and until the leasing object is completely depreciated. It is necessary to “catch” the innovation wave in time to use its objective potential fully and provide an ascending character to the wave movement, that is the one of the most important tasks of the managing engineering company at the usage of innovative leasing engineering. Management of leasing cycles at the meso-level in construction is proposed to be performed with engineering centers which specialized in the sectors, including in construction, tracing technical and technological trends in the construction sphere and performing support of the engineering companies, coordinating and supervising their activities [7].

Management of leasing cycles at the macro level should be provided by a single engineering center which manages the sectoral engineering centers and controls and coordinates their activities.

Concept of innovative leasing engineering, the goal of which is to accelerate the transition of the national economy to an innovative development path, is based on the following fundamental principles:
- the principle of synchronization of innovative, leasing and purchasing cycles in construction. Innovative leasing engineering allows to timely “catch” a wave of improving and basic innovations in construction for ensuring ascending character for innovative cycles. Growth of investment amounts, including leasing, which arise from the growth in demand for innovation leads to increase in prices for leasing services. Analysis of the practice of electronic tenders in leasing relationships showed that they are an effective tool for reducing the cost for leasing for customers-lessees at renewal of the key assets;
- the principle of systematic monitoring of technical and technological trends in construction at management of the processes of leasing cycle;
- the principle of harmonization and ensuring the combination of interests of agents of leasing relations;
- the principle of continuous monitoring for achievement of management of goals and targets by subjects, indicators of their achievement, and also for observance of the principles and mechanisms of management;
- the principle of responsibility; ensuring the responsibility of all participants in the management process of the leasing cycle for the result and achievement of the established indicators;
- the principle of completeness, effectiveness and efficiency of leasing management is to ensure full accounting, reflection and monitoring of the leasing process on all of its stages.

5. Conclusions
Development and introduction of the tool of cyclic synchronization which called the “innovative leasing engineering” in the investment and construction sphere allows to synchronize innovative, leasing and buying cycles in construction, harmonize the relations of leasing agents, reduce their risks and reduce the transaction costs, and ensure transparency of work with counterparties. Application of innovative leasing engineering helps to prevent economic crises in Russia and accelerate the transition of the national economy to the way of innovative development.

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