

## Development and Concentration Efficiency Study of Enterprises Innovation Activity in Real Sector of Economy

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### ABSTRACT

The relevance of the issue under investigation is reasoned by the fact that in growing global competition and expansion context, on the one hand, and economic constraints related to geopolitical tensions, on the other hand, a key factor in the enterprises competitiveness and priority positions achievement in the world market will be their transition to innovative production technologies and business. Topical and promising one in this case is to achieve competitive excellence, increase business efficiency through the innovations' projecting and commercialization. The paper purpose is to investigate the efficiency and specificity level of the ongoing innovation processes in the real sector of the economy as innovative transformations key segment and the basis for increasing the territory competitiveness. The leading method to the problem study is the method of systemic economic analysis, which allows revealing the essence, regularities, trends of the processes occurring at all levels of innovative transformations. To assess the innovative activity concentration and enterprises' innovative development nature, it is proposed to use analysis methods based on the cost efficiency evaluation, depending on the effect magnitude achieved as a result of innovations practical use, enabling to diagnose competitive and non-competitive producing groups, to determine the resource and innovation potential with strategy development further construction. The research materials can be used in innovative transformations management in organizations of the real sector of the economy, economic regional systems formation, the territories competitiveness management and innovative development's strategies construction.

**Keywords:** innovation, innovation implementation phases, efficiency evaluation technique, innovation costs, innovation activity, production efficiency

## INTRODUCTION

### The Relevance of the Study

On the one hand in conditions of the growing global competition and expansion, and on the other hand, economic constraints related to geopolitical tensions, the key factor for the companies' competitiveness and for priority

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positions achievement by them in the world market is the transition to innovative production and business technologies. New economic realities suggest that the Russian economy previous growth factors have exhausted themselves and the time for “quick” and “easy” money for business has ended. For the last two decades, the entrepreneurs’ main task has been a constant search for market niches, products or industries that provide a rapid capital gain. The resources redirecting to the maximum return zones allowed entrepreneurs actively to increase business amounts, but at the same time, expand it without improving efficiency and increasing competitiveness. In modern conditions, the natural growth of many markets is over and the overall economic slowdown hinders the promising zones development. Consequently, the economic entities economic and financial viability main resource should be to achieve competitive excellence, increase business efficiency through the innovation design and commercialization.

Undoubtedly, innovative technologies and products contribute to the business profitability growth and the enterprises competitiveness increase. In highly developed countries, the economic growth pace largely depends on new technologies due to the innovative projects implementation. At the same time, the uncertainty, riskiness, instability, and the complexity of forecasting are characteristic of innovative processes, particularly, at the innovative economy formation stage. The nature of innovative development is largely determined by the industrial production specifics. Not all enterprises manage timely to transform innovations from the scientific sphere into the production sphere within the framework of a functioning institutional system and changing market conditions. Investment infusions in the innovations development often do not give enterprises the desired economic effect or do not lead to the innovative goods production or services. Many enterprises are trying to implement innovative transformations in a “breakthrough” regime, without taking into account the available internal resources and external restrictions risks, which does not always lead to the strategic goals achievement.

At the same time, innovation processes, at the stage of the innovation economy formation particularly, are characterized by significant differences. The innovative processes intensity and nature are significantly influenced by external factors, formed under the influence of market conditions, the scientific and technological progress rate. In addition, the innovative development nature is largely determined by the industrial production internal specifics itself. Individual enterprises are not capable of introducing innovative ideas into real production. Investments in the innovations development do not always lead to the planned economic effect and do not reach the stage of innovative products production.

Previous studies conducted by T. N. Sedash [1], M. V. Shinkevich & T. V. Malysheva [2], B. Ya. Tatarskikh [3], T. V. Malysheva [4], T. V. Malysheva et al. [5], T. W. Faulkner [6] are devoted to institutional mechanisms of micro- and meso-systems innovative development. Theoretical and methodological issues of the enterprise innovative activity researching problems are reflected in the works of economic theory classics J. Schumpeter, I. Ansoff, P. Drucker. The issues of industrial innovations competitiveness ensuring, the study of innovation projects assessing and improving methods, the innovations implementation were investigated by domestic authors such as M. A. Avilkina [7], Yu. P. Anisimov, Yu. V. Peshkova & E. V. Solntseva [8], A. I. Shinkevich & E. A. Vardanyan [9], I. V. Yarmukhametova [10].

However, there are very few applied science works devoted to the methodology of innovation costs’ efficiency research at various stages of innovative transformations implementation, and the available works are only of a theoretical discussion nature. The aspect examined was not considered in previous studies. The problems mentioned above caused the urgency of this direction study.

The scientific paper purpose is to study the innovative processes efficiency’s and specificity’s level taking place in the real sector of the economy, which act as the innovative transformations key segment and the basis for territory increasing the competitiveness.

## MATERIALS AND METHODS

### The Study Methods

Economic entities innovative activities efficiency evaluation is a separate area of economic knowledge which is quite diverse in the types of approaches and methods used. The innovative reforms cost-efficiency assessing methodology has a significant potential for further research and optimal management solutions development to improve innovation projects efficiency and adjustment.

The innovation processes study is the economic analysis of costs’ structure and dynamics, as well as the magnitude of investment infusions effect in order to identify their more efficient use. The main purpose of innovative measures costs analysis is to identify effective and ineffective innovative projects, ways to optimize the innovative product’s value, as well as possible reasons that hinder the innovative measures implementation. The innovative transformations theory and practice has in its arsenal many different methods and practical tools for

evaluating real projects. In our opinion, the existing methodical approaches to the study of innovative costs efficiency can be classified into three groups:

1. Techniques that allow analyzing the innovation costs efficiency from the standpoint of investments efficiency in innovative projects. This approach makes it possible to carry out costs projected analysis, to evaluate specific projects in terms of the efficiency and feasibility of their implementation.
2. Techniques that allow evaluating the innovation activities efficiency at its implementation certain stages. This approach, unlike the previous one, helps to ensure effective management of the organization's innovation process structure and costs level control by innovative productions stage.
3. Techniques based on the cost efficiency evaluation, depending on the effect magnitude achieved as a result of innovations practical use.

In our opinion, in order to evaluate the innovative cost efficiency (Innovative Cost Efficiency) at the micro- and meso levels, the third "cost-benefit" method is the most acceptable from the point of view of the dynamic analysis and the innovation processes specifics of individual industries or sectors of the economy:

ICE (Innovative Cost Efficiency) = VIP (Volume Innovative Products)

VIC (Volume Innovative Cost)

As a quantitative parameter of the effect obtained, we suggest using the Volume of Innovative Products (Volume Innovative Products), namely the ratio coefficient of the output volume per unit of innovation costs (Volume Innovative Cost). This parameter will be most informative one in the study of enterprises number within the scope of economic activity type.

The purpose of the technique proposed is to provide analysts and managers of various levels with an efficient toolkit for a comparative analysis of the innovative cost efficiency, followed by enterprises clustering in order to identify the innovative projects specifics and nature. The methodology proposed will complement existing methods of assessing the innovative projects efficiency, which in combination will provide the necessary mechanism for a comprehensive analysis of the organizations innovative activities cost efficiency.

### **The Object of the Study and its Information Base**

The object of the study is the economy real sector enterprises arrays that are at innovative development different stages, which, depending on the type of economic activity, have a specific of innovative transformations nature.

The innovative activity concentration study and the innovative development nature are based on official normative documents and documents of innovative development of the Republic of Tatarstan. Within the framework of statistical reporting, information is generated about the output dynamics volumes and output dynamics, added value production, innovation activity, the innovation costs structure and their efficiency.

### **The Study Stages**

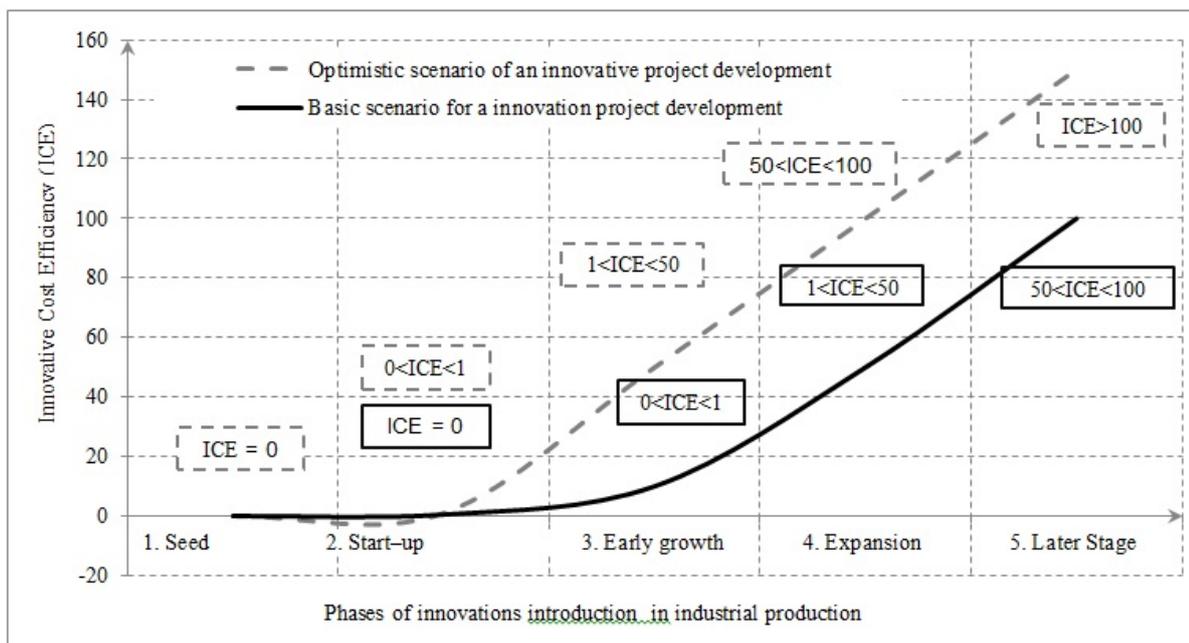
The study includes the following stages:

- substantiation of the costs' specifics and cost-efficiency at the stages of the innovation project by structuring the process of innovations implementation at the economy real sector enterprises;
- innovative activity study in the economy sectors on the basis of the enterprises concentration coefficients on the innovative costs incurred and the results obtained;
- economic efficiency level estimation of innovation costs at innovative development different stages according to the cost study technique, depending on the effect magnitude achieved as a result of innovations practical use.

## **RESULTS AND DISCUSSIONS**

### **Innovation Development Phases Determination in the Economy Real Sector and the Costs Efficiency Rationale in Innovative Transformations Stages**

The production innovation activity end result is industrial innovations in the form of new technologies, or products that are the basis of scientific and technological development. In the systemic crisis context, the innovations development in the real economy sector enterprises is particularly relevant and it should cover various areas of activity related to innovation cycles, combining research methods, technologies and enterprise management system.



**Figure 1.** Innovative costs efficiency (ICE) at innovations introduction stages in production (basic and optimistic scenarios for innovative transformations development)

Evaluation of the innovation efficiency is central one in the process of possible options' justification and selection for investing in innovative projects. The significance of the innovation implementation effect determining particularly is increased in the face of an unstable economic situation, the financial resources limitation. Theoretically, the efficiency analysis should be carried out at all stages of the innovation project implementation, evaluating and comparing investment and results. At the same time, the success of project implementation each stage must be a mandatory condition for the transition to the next level.

In general, the ongoing innovative changes in an industrial enterprise can be represented in the form of five consecutive steps or phases of introducing innovations into industrial production.

At the first stage - Seed, innovative transformations in the enterprise are in the formation phase. At this moment the enterprise has an innovative project or business idea, the process of creating a management team is being carried out, the necessary research works and primary marketing research are carried out. Accordingly, the initial investment for innovation does not have an economic effect at this phase, because there is no production of an innovative product. The innovative costs efficiency will be zero ( $ICE = 0$ ).

At the stage of Start-up development, the enterprise develops a business plan, produces prototypes, and makes attempts to organize serial production and access to the market. The enterprise's bringing out from the Start-up phase to the next stage is characterized as the most risky period. This is due to the beginning of the production sustainable output and an increasing need for investment. This period is characterized by the "valley of death" peak. The innovative costs efficiency in Start-up development phase will be zero or have a value from 0 to 1 ( $ICE = 0$  or  $0 < ICE < 1$ ). The innovative costs efficiency in this case is quantified as the volume innovative products' excess over the volume innovative cost. Phase Early growth is a border phase (Medium phase) and is characterized by the innovative products output and commercialization. The enterprise does not yet have a sustainable profit from innovation. At this stage, there is a "break-even point": the innovative products production and sales volume, in which costs are compensated by income. In the future, innovative products' each subsequent unit will bring profit.

The innovative costs efficiency in the Early growth phase will have a value from 0 to 1 ( $0 < ICE < 1$ ) or a low positive efficiency ( $1 < ICE < 50$ ).

At the Expansion phase, the company expands its business, takes certain positions in the market, and becomes profitable one. At this stage, manufacturers expand products production and sales, conduct additional marketing research, increase production capacity and capital. The innovative costs efficiency in this development phase, depending on the innovation success, will have low ( $1 < ICE < 50$ ) or average ( $50 < ICE < 100$ ) positive efficiency. The Later Stage is an entry into sustainable development. The enterprise occupies stable positions in the target market, receives a stable profit. Investors prefer companies that are at this stage of innovative development, in order to invest and to get a "quick" profit. The innovative costs efficiency in this development phase, depending on the

**Table 1.** Level of petrochemical industries extracting and processing enterprises innovative activity of the Republic of Tatarstan

	Share of enterprises producing innovative goods (services), %					The share of enterprises that carried out the costs on technological, marketing and organizational innovations, %				
	2013	2014	2015	2016	Rate of growth (decrease) 2016/2013, %	2013	2014	2015	2016	Rate of growth (decrease) 2016/2013, %
	Crude oil and natural gas production	25,0	25,0	25,0	17,0	68,0	54,2	45,8	66,7	62,5
Production of petroleum products	100	100	100	100	100,0	100	100	100	100	100,0
Chemical production	59,0	64,7	70,6	64,7	109,7	64,7	76,5	82,4	64,7	100,0
Manufacture of rubber and plastic products	50,0	68,8	56,3	62,5	125,0	50,0	50,0	56,3	37,5	75,0

innovation success, will have an average ( $50 < ICE < 100$ ) positive efficiency in case of a basic scenario for the innovative project development or a high ( $ICE > 100$ ) positive efficiency in case of an optimistic scenario for the innovative project development.

Thus, each phase of the innovation project development in industrial production is characterized by a certain range of innovative cost efficiency. The implemented innovative projects of the enterprises pass through all the phases of the above described innovative development. The vary of innovative cost efficiency's level between enterprises is determined by the innovative projects specific nature, their implementation success, and the production competitiveness level in the international market.

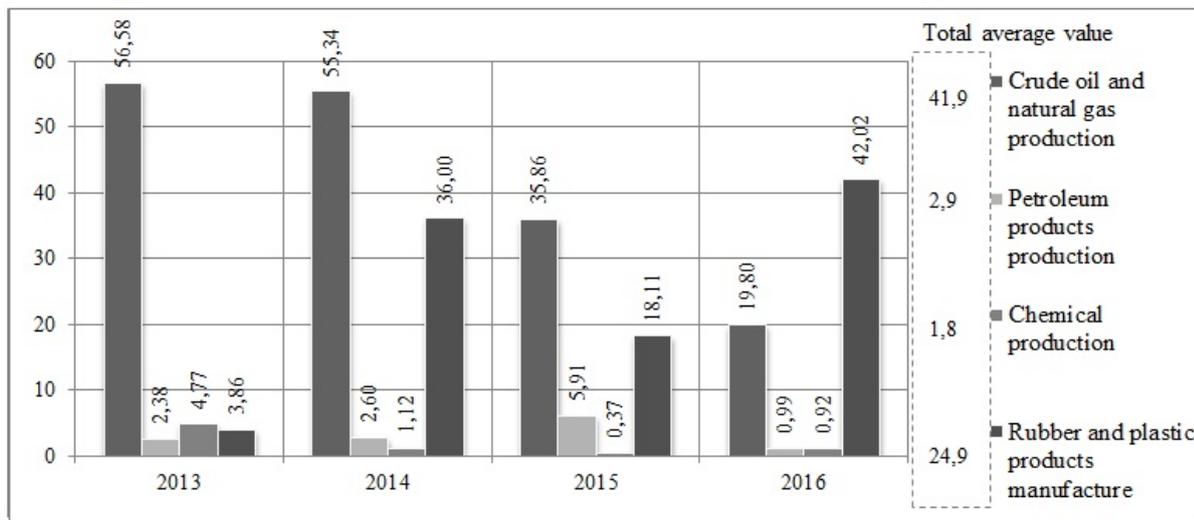
### The Study of Innovative Activity Concentration and the Nature of Enterprises Innovative Development in the Real Economy Sector

The level of petrochemical industries producing and processing enterprises innovative activity varies considerably. Despite the oil and natural gas production enterprises' significant contribution to the innovative products republic production in general, which is conditioned by the PJSC Tatneft activities, the innovative active enterprises share of this type of activity in 2016 did not exceed 17%. At the same time, 62.5% of enterprises total array carried out costs for technological, marketing and organizational innovations. This indicator in 2013-2016 did not decrease below 45%, and the growth rate for the same period amounted to 115.3%. At the same time, the extractive industries innovative products production dynamics is negative - the rate of decline in 2013-2016 is 68%. Thus, the innovative activity growth, the enterprises increasing number involvement in innovative activities has not yet affected the innovative products growth. A number of enterprises investing in innovation are not yet able to commercialize projects and start producing innovative products. Perhaps this situation is due to raw materials' prices fall, volatility in oil and currency markets. In the medium term, the economy needs to adapt to the continuing uncertainty in conditions of geopolitical tensions, sanctions and new oil prices.

The petroleum products production enterprises JSC "TANECO" and the Group of companies "TAIF" in Tatarstan are new modern manufactures with high-tech equipment that allows solving complex problems and producing competitive promising products. The projects implemented at these enterprises are modernized, innovative, and the products produced are mostly innovative.

A high level of innovative activity is shown by the chemical industries enterprises. Most of them are large-scale capital-intensive associations with a high obsolete equipment proportion, which requires the modernization of fixed assets, the renewal of technological lines. For four years (2013-2016), the share of chemical enterprises investing in innovation development ranged from 64% to 82%. In 2016, enterprises total array share among this type of activity was 64.7% or 2/3. A similar situation is observed in innovative products production, where 64.7% of enterprises also shipped innovative products or services in 2016. A similar situation is observed in the production of innovative products, where 64.7% of enterprises also shipped innovative products or services in 2016. The chemical industries relatively high innovative activity, where 2/3 of the enterprises are covered by innovative activities, will contribute to the further development of the economy sector and will allow producing high-tech competitive products.

The bulk of enterprises producing rubber and plastic products in the Republic of Tatarstan, as well as chemical production, are the basic petrochemical industry enterprises - "long-livers". On the one hand, such enterprises presence, speaks about the territory economic success and stability. On the other hand, enterprises with centuries-old history do not fully meet the requirements of modern business due to the high proportion of worn-out



**Figure 2.** Innovative costs efficiency by activities types of the petrochemical complex of Tatarstan Republic (innovative products volume ratio to the innovative costs volume), rubles

equipment and obsolete technologies. In this situation, the key to production success and its further development is an effective investment and innovation policy. In 2013-2015, more than half of the enterprises producing rubber and plastic products carried out the innovative costs. In 2016, the innovation-active enterprises share decreased to 37.5%. At the same time, the dynamics of organizations share producing innovative products is positive: over the past four years, the growth rate has amounted to 125%. About 2/3 of the enterprises producing rubber and plastic products are involved in innovative activities.

Petrochemical industries innovative activity activation can be facilitated by the formation of an intra-republican “supplier-consumer” network, where the leading enterprises innovation potential from the view point of innovations introducing will stimulate enterprises - outsiders to implement innovations. It will be a self-regulating inevitable process, leading in the future to the leveling of adjacent industries technological development levels - links in the production chain.

### Innovative Costs’ Economic Efficiency Level Estimation at Various Phases of Enterprises’ Innovative Development in the Real Economy Sector of Tatarstan Republic

The innovative activity nature and effectiveness can be estimated by the traditional “cost-result” method or by the ratio of innovative products production volume to the volume of innovative costs. **Figure 2** shows the production dynamics of innovative products per unit of investment costs. The enterprises resource potential is an important factor that influences the innovative activities development. Innovative projects are often characterized by significant costs at the initial stage. Projects, as a rule, are long-term, which does not allow enterprises to receive “quick” profits. In this regard, the performance indicator annual dynamics is not indicative, and its interpretation is not correct. Time lag between investing costs and obtaining an effect can be smoothed by summing the initial parameters for a number of years. So, when comparing innovative investments with the innovative products production volumes, it turns out that on average in the petrochemical industries’ extracting and processing enterprises, the total four-year effect is 17.8 rubles for one ruble of costs incurred and differs significantly by sectors of petrochemical complex. The greatest efficiency is demonstrated by oil and natural gas production enterprises, where from one ruble of invested costs 41.9 rubles of innovative products is produced on average for 4 years (2013-2016). About 25 rubles of innovative products per unit of costs is produced by the rubber and plastic products production. The innovative costs intensity of enterprises producing petroleum products and chemical industries is 2.9 and 1.8, respectively.

As it can be seen, in terms of the leading activities, namely, the extractive industries and the rubber and plastic products production, innovation costs efficiency indicator has a wavy dynamics. The wavy curve of innovation activity efficiency has a classic form of phase development and speaks of producing “real” innovations, rather than innovation activity “imitation”, as it often happens when the economy moves to the path of innovative development.

The curves described above, which characterize the features of the production innovative activity, indicate a concentration different level in the sector of the enterprises economy of innovative development’s particular stage.

**Table 2.** Distribution of petrochemical enterprises investigated array in the Republic of Tatarstan according to the level of innovative costs economic efficiency (total efficiency index for 2013-2016)

Groups by the level of innovative cost's efficiency	The index value of innovative costs' efficiency (the ratio of the volume of innovative products to the volume of innovation costs, rubles)	Enterprises distribution by the level of innovation costs effectiveness					
		Number of enterprises, units	Share of enterprises, %	Enterprises' presence in groups by types of productions, units			
				Crude oil and natural gas production	Production of petroleum products	Chemical production	Manufacture of rubber and plastic products
1 group - High efficiency	More than 100	5	9,1	2	-	-	3
2 group - Average efficiency	From 50 to 100	2	3,6	1	1	-	-
3 group - Low Efficiency Effect	From 1 to 50	17	30,9	3	-	8	6
4 group - Negative efficiency	Less than 1	10	18,2	2	1	5	2
5 group - Lack of efficiency	Production of innovative products is absent	21	38,2	16	-	3	2

Presumably, in oil and natural gas extraction 2013-2014 years demonstrate the phases' completion in the development of Expansion and Later Stage (Sustainable Development) in one group of enterprises and innovative projects' implementation beginning (Seed and Start-up phases) in another group of enterprises.

There are all levels enterprises of innovative development in the production of rubber and plastic products. The broken curve trajectory may also indicate the short-term innovative projects implementation and, correspondingly, their short payback period.

The innovative activity nature of petroleum products and chemical production has an almost linear structure, which does not allow us to single out the phases of innovative projects introduction. This situation can be described either as the protracted initial stages of Seed and Start-up, or as the restrictions impose on the innovative products production due to unfavorable market conditions.

The above assumptions about the enterprises' different concentration level of innovative development's particular phase in the economic sectors are confirmed by the distribution of petrochemical enterprises investigated array in the Republic of Tatarstan in terms of innovation costs' economic efficiency level. So, the extracting and processing petrochemical enterprises aggregate depending on the innovative costs efficiency in 2013-2016 can be conditionally divided into five groups: three groups with a positive effect from an innovative project, a group with a negative effect and a group where the effect of the produced costs is absent (Table 2).

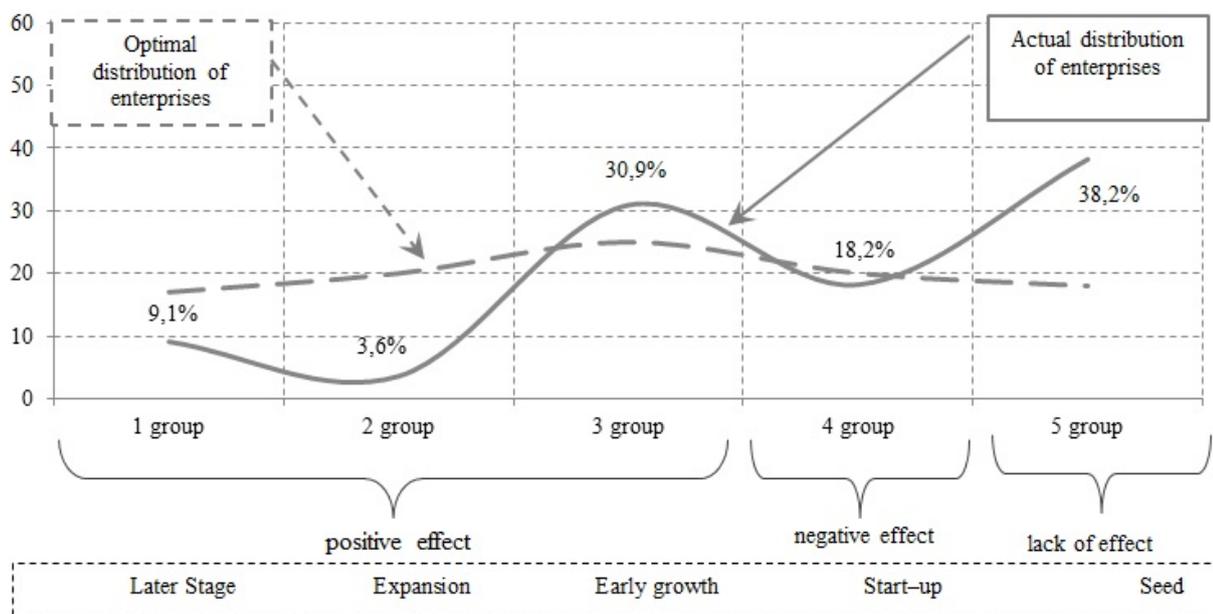
The group with the highest effect from the invested innovative costs (more than 100 rubles of innovation products per unit of costs) included 5 organizations or 9.1% of the total population in the array of enterprises under study. By productions types, this group was represented by oil and natural gas production enterprises and manufacturers of rubber and plastic products. These are competitive enterprises producing export-oriented products, points of growth in the innovation economy. The enterprises production capacities ensure the ideas implementation and improvement of the products and services provided.

The innovative costs' average efficiency is shown by 2 enterprises (3.6% of the total massif) representing the type of activity "crude oil and natural gas production" and "production of petroleum products". These are modern, dynamically developing enterprises with a powerful production base.

About a third of the enterprises studied (30.9%) were included in group 3 with a low efficiency of innovative costs. Among the 17 enterprises there were 8 organizations of chemical industries, 6 producers of rubber and plastic products and 3 mining enterprises. Relatively high costs with a low volume of innovative products in this group may indicate both the implementation of long-term innovative projects, the effect of which is expected in the short term, and the insufficiently effective activities.

The group with the negative effect from the produced innovative costs is 10 enterprises, or 18.2%. This is almost every fifth production, where for costs every invested ruble less than 1 ruble of innovative products can be obtained. This group consisted mainly of associations with a high share of morally and physically obsolete equipment. The transition process to an innovative model of production development here will be quite long and capital-intensive.

The fifth, the most numerous group is the enterprises, where, against the background of the costs incurred, there is no production of innovative products in the period under review (2013-2016). This included 21 enterprises, which is 38.2% of the total array of petrochemical industries under investigation. More than 75% of enterprises in this category are organizations on "extraction of crude oil and natural gas." Many of them for four years show innovative activity in the form of carrying out the innovative costs, but do not produce innovative products. A possible reason for this situation is the absence of immediate incentives to change the production's strategy and



**Figure 3.** The distribution of petrochemical complex enterprises in the of the Republic of Tatarstan according to the groups of innovative costs economic efficiency (the total efficiency index for 2013-2016, in% of the total number of enterprises)

tactics in the short term due to sufficiently high level of products competitiveness in extractive industries in the domestic and foreign markets.

**Figure 3** shows the distribution curve of the array of the petrochemical complex enterprises under study in the Republic of Tatarstan in terms of innovative costs efficiency level. Here the author presents the prospective type for enterprises' most optimal distribution by efficiency groups, which is characteristic for a balanced innovative economy, where innovative projects from the Seed phase to the Later Stage phase are present in certain proportions.

The curve of enterprises' actual distribution can be interpreted as follows. According to innovative projects development phases and their inherent innovative costs' efficiency, it can be assumed that about 55-60% of petrochemical industries producing and processing enterprises are at the initial stages of introducing innovations (Seed and Start-up phases). About a third of enterprises or 30% have entered the most important border phase of Early Growth. At the final stage - the Expansion phase and the sustainable development phase-Later Stage are, respectively, the remaining 10-15% of innovatively-active companies. These assumptions will be objective under the condition of a standard time cycle of implemented innovations of 3-5 years.

The prospective type of enterprises the most optimal distribution by efficiency groups has an almost linear structure with a slight peak in group 3. Linear form indicates a uniform distribution of meso-level enterprises in the innovative implementation phases. Moreover, the optimal distribution will be linear in terms of a relatively standard time cycle of innovations being introduced and a constantly maintained level of enterprises innovative activity, i.e., completing the final stage of Later Stage innovations introducing, the enterprise moves to the initial stage of Seed for a new innovative project implementation. Peak value in the third group zone with low positive efficiency indicates a longer phase of Early growth, where of innovations' responsible transition occurs in the Expansion phase, characterized by a high risk of falling into the "valley of death".

As it can be seen, the petrochemical complex enterprises' actual distribution by groups of innovative costs economic efficiency to date is to some extent approximated to the expected optimal distribution which is characteristic for a balanced innovation economy. However, there are at least two discrepancy significant areas between the actual and optimal curves.

The first significant deviation from the normal curve is observed in the initial stage zone of innovations introduction - the "seed" phase. This situation can be caused both by enterprises' high activity and maximum involvement in the innovation process in 2015-2016, and by delaying this stage of innovation. At the Seed stage, innovative projects are in the being formed process: the company has an innovative project or business idea, carries out the necessary R & D and primary marketing research. To the Start-up second stage transition, the enterprise at least should approach the production of prototypes, and, as a maximum, the organization of serial production and entry to the market. For whatever reasons, the innovative projects transition to the Start-up stage does not take place. Perhaps the inhibiting factor in innovation development is the R & D imperfection or the low probability of commercializing an innovative idea. Thus, enterprises need to relate more carefully with the innovative business

ideas' development or selection, develop their own research base, and effectively interact with specialized research institutes. This problem should be fully considered at the regional level from the viewpoint of innovations ecosystem formation. The second deviation in the form of an obvious "failure" is observed in the innovations' Expansion zone phase. In all likelihood, a number of enterprises experience difficulties in entering the Expansion phase from the early growth phase. As it was repeatedly stated above, this transition is the central critical one in innovations whole cycle and is accompanied by a high level of financial and economic risk. The individual enterprises to have "stayed" at the third stage of Early growth possibly will be able to "break through" to the next level of the innovative project implementation, expand production and reach a higher level of innovation efficiency. At the same time, such a small the 4<sup>th</sup> group of companies (3.6%) testifies to the possible incapacity of some innovative projects, i.e. their "attenuation" in the Early growth stage. In other words, it can be assumed that part of enterprises innovative projects have fallen into the "valley of death".

## CONCLUSION

Thus, the study revealed that significant fluctuations in the level of innovative costs' economic efficiency for enterprises and types of production are due to the following factors:

Innovative transformations in the Republic of Tatarstan, as in Russia as a whole, are at the initial stage, which is characterized by uncertainty and instability of ongoing processes, imperfection of the institutional environment - the innovations ecosystem. To date, there are still "high" barriers to innovations in the real economy. In addition, enterprises are not sufficiently motivated to choose the model of innovative development. This is due to the low efficiency of R & D implementing by own forces in comparison with investment due to the weak branching and throughput of the institutional innovation system.

1. The effectiveness of innovative processes is negatively affected by the unstable political and economic situation, limited financial resources, market volatility. Developing innovative economy is extremely sensitive to the state of the external environment. The financial instability conditions, the markets contraction inevitably reduce the development pace, investments' "pulling" from innovative programs to socio-economic and political stability ensuring. At the same time, under the economic development's mobilization scenario the innovation processes' acceleration is possible, "breakthrough" innovative ideas' implementation in order to smooth out the negative consequences of the crisis and the economic growth rates equalization.
2. Relatively low efficiency and innovative processes instability is a consequence of the enterprises' or specialized research institutes' R & D low quality. At the stages of innovative projects implementation the theoretical scientific developments do not always turn into a practical level, show their inability to be commercialized, while the R & D quality determines the innovative transformations efficiency and competitiveness. This problem concerns not only scientific institutions, but also strategic marketing services that study and predict the future of an innovative product.

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