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The Features of Management of Innovation Risks at Pre-investment Stage of the Project in Modern Economic Realities

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ABSTRACT

The research deals with conceptual and methodological problems of investment project management including the questions of innovation risks or in other words risks of innovations at different stages of the project but mainly in respect of pre-investment stage. No doubt, one of these problems is organization or conceptual architecture of such projects, which can in general depend on the processes exactly at pre-investment stage. It's clearly known - most investment initiatives were failed because of key weaknesses just when project had been in the form of idea. That's why it's extremely significant to form proper mechanisms or models which can let interested participants to determine the risks and influence of different factors both on the results of innovations and execution quality of investment projects and programs. Taking into account the specifics of investment project management and different methodologies of project organization in different industries, using methods of analogy and stage case-analysis, conditions the author's "Model of investment project effectiveness assessment and management of innovation risks" was developed and represented in this scientific work. This model is especially usable for construction industry. We can certainly say that the effectiveness of investment projects can depend on the combination of some indicators such as net present value, lifecycle of the project, the number, quality and dynamic of movable and immovable fixed assets changes, innovation and other types of risks at different project stages and the methodology of project organization.

Keywords: Innovation Risks, Investment Project, Methods of Modeling
JEL Classifications: M11, M21

1. INTRODUCTION

Discovering and estimation of key factors and their order and priority for the final result of investment project is really serious problem for participants in organization, control, and adjustment of economic activities. One of the main parts of investment project management is risk management of innovations. Risk-management segment takes proper place in theories of investments. As far as we concerned, risk-management can be recognized the most important at pre-investment stage of the projects when the decision-making processes turn to fully active phase. That's why methodological and methodical base development from our point of view orders significant enough improvement. All mentioned conclusions determine tasks of the research:

- To study the features of investment projects assessment to discover rational and optimal tools of management of innovation risks at different project stages;
- On the basis of this study it's planned to develop main points of project organization methodologies in construction sphere in goals of innovation risks appropriate identification, prevention and minimization;
- To develop "Model of investment project effectiveness assessment and management of innovation risks."

2. LITERATURE REVIEW

The researches of Bartošová et al. (2015) and Jasiukevicius and Vasiliauskaite (2015) have significant enough scientific value in

the methodological aspects of investment project risk management, including strong instruments of risk assessment, represented in these articles.

Questions of financial concepts development of investment project management are widely highlighted in the scientific works of Chirkunova et al. (2016).

Paquin et al. (2016) have prepared the conceptual mechanisms of analysis of capital investment projects as a part of combined project portfolio management.

Tatarkin and Romanova (2014) and Tatarkin and Sidorova (2014) have underlined the features of global investment projects as a part of industrial policy in goals of socioeconomic development at regional, local and national levels, including railway and gasoline processing infrastructural projects. Transport infrastructural projects are discussive. Khraibani et al. (2016) have considered the key problems of investment ways in this industry.

Taxes and taxation have great influence not only on national economy but also – at investment climate at the country, investment project risks, costs and prices. Such influence can be represented in different forms and stages of economic relationships. Property taxation of immovable property can determine the demand for real estates, what is represented in the article of Zaichao and Zhang (2015). Some segments of articles of Nerudová and Dobranschi (2016), Mayer-Serra (2014) and Sineviciene and Railiene (2015) are devoted to one of the main problems of modern economy - the relationships between taxation, investments and innovations at the whole.

The use of innovations can provide different additional technical risks. This actual question is the significant part of, in our point of view, scientifically-valuable researches, such as articles of Peng et al. (2016), Yingjian et al. (2016), Kayser (2016) and Oesterreich and Teuteberg (2016).

3. METHODS

Methodological and methodical base of the research consists of various methods: Comparison, analogy and analysis, cause-and-effect relations (subject-object and part-the whole). Theoretical basis of the scientific work is theories of management of innovation risks and also theories of investments. Besides we can offer method of stage case-analysis for investment projects in construction industry (Table 1).

Almost equal methods are widely used in IT-sphere, to be exact – in quality assurance management (QA-management). And we use similar ways to determine the possibility of switching between project stages. In Table 1 six columns are represented.

The first one is "Stage." We can underline six standard stages of investment projects in construction industry:

- Pre-investment stage when the ideas are discussed in abstract or not final form;
- Planning stage when little amount of financial, labour and other resources are used in processes of meetings and discussions, brainstorming, conversations, making business-plans, program and methodic of testing;
- Stage of realization includes not only executive arrangements but also continuation of financial, labour and other resources optimization;
- Transfer and acceptance stage focuses on preparation of the object to revision of customer;
- If previous stage is successful, the interested persons sign the documents and the project gets successfully ended status;
- In some cases the list of post-project support activities can be underlined in the project contract when maybe some specialists of construction company have to participate in these events;
- Utilization stage is final in strategic perspective in respect of investment projects in construction industry and means liquidation of the object, cleaning environment and etc.

The second column is "expected result," where planned results of the stage are shown and the third can be named as "actual result" where the real results of the stage are represented. The 4th column is "Compliance" only with 2 variants values "Yes" if expected and actual results are equal and no if these values don't match. The 5th column is "Reason of discrepancy" in which it's possible to make brief description of discrepancy. And the 6th one is influence. Surely the influence of discrepancy must be figured out in this scheme of analysis. We can fix 4 degrees of such influence:

- Blocking – when the project cannot turn to the next stage;
- Critical, meaning that project can go to the next stage but with significant allowances;
- Medium;
- Low.

Medium and low stages have one difference from critical – number and importance of allowances what is also necessary to prevent and reduce risks of innovations and other types of risks.

In Table 1 we present simple example of possible investment project. As we can see the first stage was marked as "blocking

Table 1: The structure of stage case-analysis on the example of possible investment project

Stage	Expected result	Actual result	Compliance	Reason of discrepancy	Influence
Pre-investment	Proper conditions are supported	Proper conditions are not supported	No	Not enough financial resources	Blocks further stages
Planning	-	-	-	-	Blocked by previous stage
Realization	-	-	-	-	Blocked by previous stage
Transfer and acceptance	-	-	-	-	Blocked by previous stage
Final acceptance	-	-	-	-	Blocked by previous stage
Support	-	-	-	-	Blocked by previous stage
Utilization	-	-	-	-	Blocked by previous stage

Source: Made by the authors

further stages" and the other stages have status "blocked by previous stage." The reason of this situation is absence of proper financial-resource support. And this project was closed in the form of initialization.

As a rule, most defects and risks of innovations occur at pre-investment stage. The structure of risks, defects and possibility to switch between project stages as we said above, depend on methodology of project organization. We present the variants of proper methodologies for investment projects in construction industry below at results of the research.

4. RESULTS

As we said above right methodological choice of structure and procedural organization is the base of absolute number of successful projects. Almost all of them have necessary IT-support, which depends exactly on certain project architecture and management processes. So we suppose some IT-development methodologies can be transformed and adopted to allied sphere of national economy – construction industry. That's why we prepared 7 methodologies of investment project organization in construction industry and now can show them at Figure 1.

On the basis of methodologies prepared methodologies of organization of investment projects in construction industry, using method of stage case-analysis described above, we can present our model of "Investment projects effectiveness assessment and management of risks of innovations." This model has hierarchical structure of main indicators, factors, and metrics to solve the main problem considered in the research. The model is presented below at Figure 2.

5. DISCUSSION

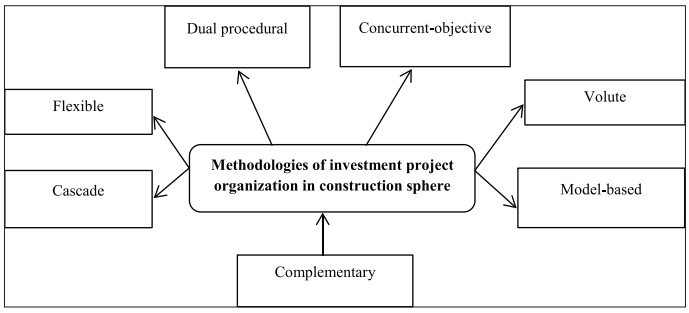
5.1. Authors' Methodologies of Investment Project Organization in Construction Industry

As we can see on Figure 1 there are 7 project organization methodologies.

5.1.1. Cascade methodologies

This type of methodologies provides enough too strict order and reglamentation of all investment project stages. Switching between current and previous stages is hard and takes a lot of different resources. Innovation risks at pre-investment stage of such projects are not so high what is the result of long processes of discussions and primary but solid risk-analysis. But it's hardly possible to realize some innovations easily at further economic activities because there are too many obstacles, for example, bureaucratic and formal procedures, number of documents to arrange, etc. But risk assessment is at the second place only after volute methodologies. No doubt this can be recognized as great plus and taken into account when the choice of methodology for project is being made. The examples from Russian Practice are Olympiad in Sochi 2014 and World Football Championship in 2018. Of course these projects have detailed and accurately prepared business-plan for middle or long-term perspectives and business-requirements change in limited number of cases.

Figure 1: The methodologies of investment project organization in construction industry



Source: Made by the authors

5.1.2. Flexible methodologies

The antipode type of methodologies in relation to cascade are flexible methodologies. They let to participants of the construction investment project almost full freedom and opportunities to switch between stages, change the order of these stages and transform management processes. A large number of "human factors" in these methodologies is in their nature because conversations between managers, chief executive personnel (for example head of the construction team) and clients are very often. At the meetings concerned parties discuss not only working processes but interim results and risks, including innovation ones. On one hand of the main pluses these methodologies can offer to participants is the possibility for clients and investors to get operatively prepared information about current project status and make decisions about fit or misfit of interim results to their view on the final conditions. On the other hand the pluses determine the minuses what means the difficulties to determine real degree of innovation risks. But it's easy to bring and realize such innovations even at deep execution process. Flexible methodologies are completely ideal in respect of assembly and disassembly construction objects such as hangars, oil and gas mains and etc.

5.1.3. Dual procedural methodologies

These methodologies as we can understand are based on dual-process system. The project is divided into dual tasks. Planning and executive tasks must always have related revision and testing tasks. The strict organization order makes this type of methodologies familiar to cascade ones. The examples we can underline are following: Hospitals, kindergardens, schools, universities, power stations and other object with sustained character of functioning. The amount of testing reduces risks of innovations and other types of risks greatly.

5.1.4. Concurrent-objective methodologies

The situation when different parts of one project are in zones of responsibility of different teams is not so unusual. These parts take forms of independent mini-projects or parallel projects. In particular the scheme when houses or flats are presented in commercials with developed infrastructure such as schools, kindergardens, nearby forests, rivers, ecological conditions and etc. The quality of housing and objects mentioned above is often supported by separate companies but the final result is synergy

combination. The minus of these methodologies is related risks at different parts of the project. Negative influence of one part.

5.1.5. Complementary methodologies

The concept of these methodologies is sustainable addition of new innovations to the existing object, which has not all but some of the final characteristics. The assessment of innovation risks is the best in all seven methodologies. Other types of risks are being assessed on regular basis. Large industrial complexes, Moscow Ring Railway, Moscow Metro are the most famous examples of use of these methodologies. Characteristic feature of such projects is necessity to dilate their tangible fixed assets base in time with changes in social, infrastructural, economic needs of society in respect of state projects and maybe the market conditions for private companies.

5.1.6. Model-based methodologies

This variant of methodologies can be characterized by relatively low business requirements detail. At the stage of realization the first rough object can be prepared and then needs some updates on what the specifics of these methodologies is based. The last examples we have noticed are infrastructural decisions in Tsaritsyn Park in Moscow.

5.1.7. Volute methodologies

This is a variant of complementary methodologies but with more significant focus on risk-oriented concepts. As a rule, negative result of the project may cause to failure for business activity of the company at the whole. Some examples from Russian practice have high socioeconomic importance - infrastructural projects for extraction industries support in extreme conditions of Far North.

5.2. Model of Investment Project Effectiveness Assessment and Management of Innovation Risks

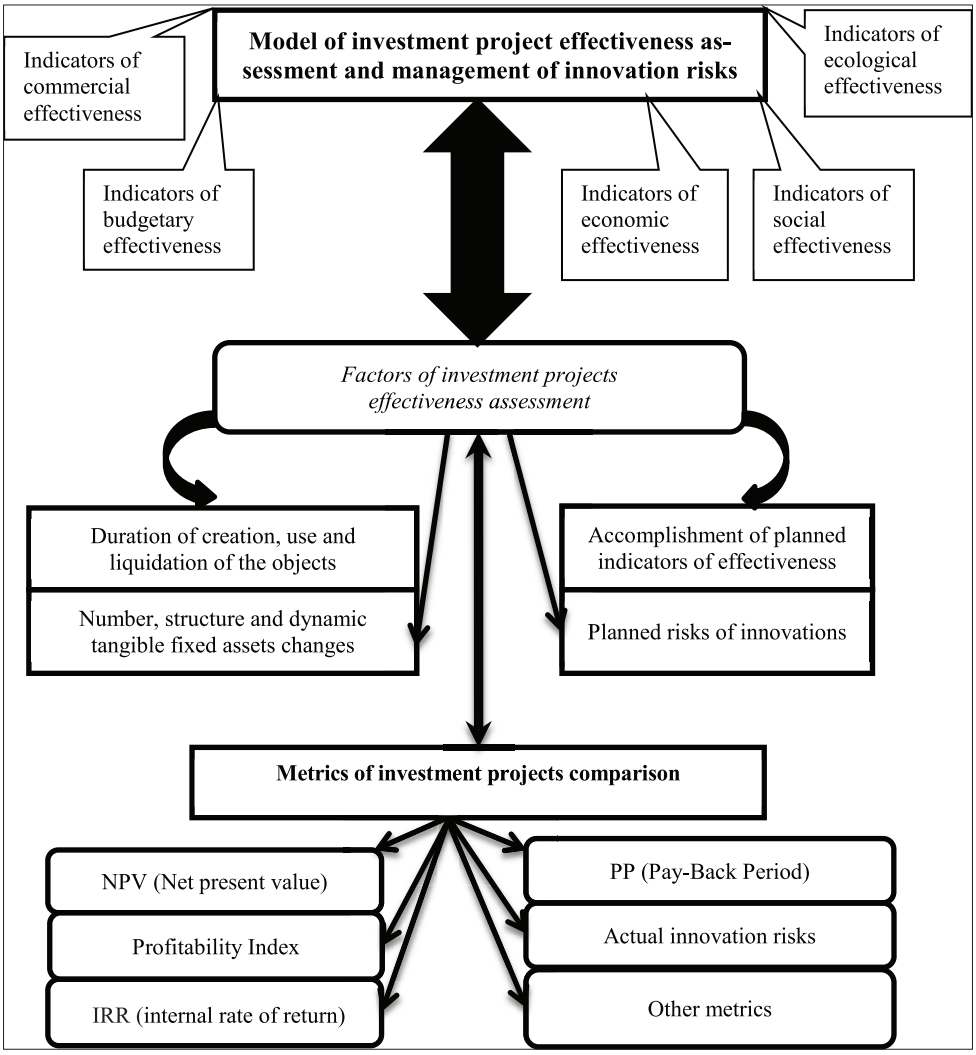
The model is presented in Figure 2.

5.2.1. Description of the model

As we can see at Figure 2 the effectiveness of investment projects can be characterized by some types of indicators:

- Indicators of commercial (financial) effectiveness, which take into account the consequences of project realization for participants;
- Indicators of budgetary effectiveness, showing financial consequences and significance of the project for federal, state, regional, province, municipal or some other budgets

Figure 2: Model of investment project effectiveness assessment and management of innovation risks



Source: Made by the authors

of different levels in relation to administrative and territorial division of the country;
- Indicators of economic effectiveness take into account the costs and results of project execution but behind the sphere of participants' interests;
- Indicators of social effectiveness can show influence of the project to social situation, for example large projects can be important source in creation of jobs;
- Indicators of ecological effectiveness can help to understand favorable or unfavorable influence of the project to the environment in certain area.

Economic effectiveness evaluation is optional for the majority of the projects, excluding only the largest, concerning the interests of cities, regions and country in general.

Estimation of possible social and ecological consequences and the costs of prevention and liquidation of these consequences are in zone of company's monitoring and executive departments' reliability.

There are clear interactions between indicators and factors of investment project effectiveness assessment. We can focus the attention on four mentioned in model:
- Time of creation, use and liquidation of the project objects;
- Number, structure and dynamic of tangible fixed assets changes;
- Accomplishment of planned indicators of effectiveness;
- Planned risks of innovations.

The first factor is time of creation, use and liquidation of the project objects. Surely lifecycle of the project plays key role in lifecycle of the created objects. Number, structure and dynamic of tangible fixed assets changes determine technical and technological support of the project at all project lifecycle. The accomplishment of planned indicators of effectiveness is basic factor and should be taken into account firstly. Risks of innovations can be partly covered by proper use of tax allowances. The most popular tax allowances in world practice are: Tax exemption of profit on terms of reinvestment, investment tax credit, tax exemption of plants and equipment from property taxes, lower tax rates, investment tax deductions and etc.

Factors we underlined above on the other hand have interference on some standard and non-standard metrics letting to compare different investment projects:
- Net present value;
- Profitability index;
- Internal rate of return;
- Pay-back period;
- Actual innovation risks;
- Other metrics.

6. CONCLUSION

Investment projects are initiated in different cases. It can be social, economic, budgetary, infrastructural and ecological demand or nature process of private company's diversification, upgrade, policy and scales change, etc. These projects as a rule have the main goal of system development and provide creation of new inventions and devices or maybe new ways to use the existing.

Therefore construction investment project can be considered as a list of some measures:
- Architect;
- Engineering;
- Economic and financial plans;
- Works on object foundation with the result of income from use.

From this point construction investment project management includes planning and development of necessary documents, labour resources management and coordination, provision of material resources and fixed assets at all stages of the project lifecycle.

To achieve these results we offer to use our variant of method of stage case-analysis for construction projects in combination with the authors' modification of methodologies of project organization for this industry and "Model of investment project effectiveness assessment and management of innovation risks." All these instruments can be used by potential investors and current participants of the projects in project management, assessment of project effectiveness and covering innovation risks at pre-investment project stage what can prevent or reduce financial losses, negative social, ecological, law and other consequences. We should mention - proper use of tax allowances cannot cover all risks but no so little part of them. There are different tax allowances in Russia for various stages of the project such as investment tax credit, exemption from corporate property tax in some situations and other tax stimulation mechanisms.

At the end we want to say that effective investment activity formation at pre-investment stage of the project can protect the company from bankruptcy and raise its competitive power in modern economic realities.

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