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## Organizational-economic mechanism of formation of the investment policy of engineering companies

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### Abstract

In modern conditions, the role and importance of investment policy pursued by machine-building enterprises are increasing. First, the investment policy of machine-building enterprises is a complex, interrelated and interdependent set of activities aimed at their further development, obtaining positive effects from investment. The investment policy is aimed at creating conditions for the optimization of investment resources, at a rational combination of various financial sources, at achieving significant integral indicators of the effectiveness of investment projects, and in total – at economically verified escalation of production. Secondly, it is impossible to create conditions for sustainable growth of machine-building enterprises without eliminating the lag in investment development, which would help to strengthen the industry. At the same time, investment policy is of paramount importance to meet the needs of the state and business in modern engineering products. A separate source of investment includes venture capital investments, i.e. funds placed in new projects with a high level of risk with the expectation of the effectiveness of several or one of them to extract high profits. The main sources of financial support of the enterprise of machine-building complex which in the conditions of limitation of financial resources give the chance to activate its investment activity, to keep presence in the market are revealed.

### For citation

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### Keywords

Management, digital economy, formation, company, investment, finance.

## Introduction

The economic crisis and the subsequent sanctions against Russia have aggravated the situation and made it difficult to attract investment. Today, measures are required to stabilize the investment component and reduce investment risks, which will solve the problem of introducing new equipment and technologies, increase the liquidity of financial resources invested in the enterprises of the machine-building complex. A comprehensive action plan of the Russian Government for the period up to 2025 is aimed at achieving these goals.

In organization of the investment policy of the enterprises of machine-building complex a number of fundamental conditions should be taken into account, in particular, periodic changes in the investment environment, volatile investment activity of enterprises caused by the crisis manifestations in the economy, etc.

It is possible to intensify the investment activities of machine-building enterprises by means of a common coordinated investment policy at the macro and micro levels; this will make it possible to work out certain areas of technical and technological activation of machine-building enterprises, to create a basis for a qualitative choice of the direction of investment and the distribution of financial flows by using the existing potential and their resource investment opportunities.

In this aspect, it is expected that the impetus for investment in the machine-building complex will be given by the provisions of the Forecast of long-term socio-economic development of the Russian Federation for the period up to 2030", within which it is planned to launch investment projects in the near future, which is dictated by the needs of the country's economy. In particular, according to the forecast, investment growth in mechanical engineering is expected, which may reach 10 percent in 2030, and investments in fixed capital of mechanical engineering enterprises will increase by 6-8 times by 2030.

Theoretical and methodological basis of the study are the economic categories, principles and laws; it is based on the theory of investment policy management and enterprise management.

The author used general scientific and private methods of analysis; works of domestic and foreign scientists, monographs and lectures, periodicals, legislative and regulatory acts, statistical information.

A retrospective review of domestic scientific sources, including the issues of investment policy of machine-building enterprises, in particular, has showed that the desired problem is in development, covering a fairly wide horizon of opinions.

## Main part

The issues of investment policy were considered by J. Downes , D. Stone, etc. [Block, De Vries, Sandner, 2010], however, from the point of view of the research topic the author of the thesis proposed approaches to the interpretation of the category "investment policy" proposed by the Russian scientists.

The following definition of investment policy is proposed: it is a complex, interdependent set of activities to select the most profitable investments for the implementation of the production process aimed at creating a positive investment climate, the implementation of the investment strategy of machine-building enterprises in order to increase the investment potential to obtain positive effects from investment.

It is concluded that the investment policy is a leading determining factor in improving the efficiency of a variety of investment resources, achieving significant integrated performance indicators of investment projects.

Investment activity of the enterprises of machine-building complex as an integral part of investment

policy consists in obtaining new types of products, solutions of organizational, technical, economic, social orientation to obtain the necessary results from this activity, for which it is important to use the organizational and economic mechanism aimed, including the formation of investment policy of enterprises of machine-building complex.

On the one hand, the investment activity of machine-building enterprises is financed from federal sources, which ensures structural restructuring, preservation and development of production and non-production potential, etc., which cannot be implemented without investment support. On the other hand, it is important to attract private investment for the long term.

Modern economic dictionary explains the "mechanism" as a set of directional impact that seems to include some actions, the order of the device, or any phenomenon.

The interpretation of the category "organizational and economic mechanism" was addressed by domestic and foreign researchers. In particular, scientists see in the organizational and economic mechanism of machine-building enterprises a set of system elements that reflect the actions of planning, analysis, development and implementation of the competitive strategy of the enterprise [Baboshkina, Savina, Morozov, 2018].

The organizational and economic mechanism as a complex of economic relations developing in the process of formation of financial resources was studied by different scientists [Kosmin et al., 2017].

In this context, the organizational and economic mechanism of the investment policy of machine-building enterprises is seen as a set of components (tools, methods, methods, procedures, rules) of investment management for the production of engineering products, the introduction of new technologies, products, organizational and technical solutions, and other results of the enterprise.

Estimated options for assessing the economic efficiency of new types of products are proposed on the example of 3 projects contained in the investment plan of the enterprise for the medium term (in particular, the proposed investment project is designed for 6 years).

Calculation of the effectiveness of investment projects is determined by Methodological recommendations [Kholiavko, 2013]. This method offers the main investment sources, first of all, external funds. When implementing investment projects, other types of investments can be attracted, especially in the final stages.

With the adoption of the investment project, machine-building enterprises will not change the general conditions of the schedule of their activities, which may also be associated with investment risks for the real project. Using the risk component, similar restrictions for the calculation of the cost of capital can be neglected.

The possible alternative options for assessing the economic efficiency of the investment project are calculated.

Project 1. Introduction of a new technology for the production of rubber compounds. The laboratory and production base available at the enterprise gives the chance to let out a wide line of rubber mixes and rubber-technical products. The structure of the production includes vulcanization presses with dimensions of plates from 300 x 300 to 1200 x 1200 mm, high-filled and high-viscosity rubber products manufactured by machines MCH 32 and 90.

Project 2. Production of rubber products. With use of modern production base, release of the wide range of rubber products which are applied in mechanical engineering in the hydraulic and pneumatic equipment is carried out. The company, in particular, manufactures mud collectors, end seals, etc. products.

This type of seals, as well as their components (plungers, rods, pistons) is used to protect the internal cavities of pneumatic and hydraulic cylinders from various external contaminants, such as sand,

dirt, moisture, chemicals, etc.

Mud collectors are the most popular parts – they are used in large numbers in pneumatic and hydraulic devices. The working environment of the sump, it is a variety of liquid and oil. Mud collectors are resistant to mechanical influences on them, reliable and stable work in all kinds of conditions. In conditions determined by design features, they are able to pass from the hydraulic system and back a very thin oil film, or block it completely. These seals are available bi-directional and unidirectional. They are applied in various industrial branches, in particular, on motor transport, in construction equipment, in various industrial equipment.

Sealing elements can be made to order according to the presented drawings.

Project 3. Production of auto parts. Auto parts (brackets, racks, radiators, racks, boards, etc.) must be produced serially and on individual orders mainly on crank presses.

Both metal alloys and various materials are used in production. In particular, body parts are made using special stamps. The quality of the products corresponds to the drawings and master models.

Production is carried out using mathematical modeling, which guarantees high quality performance, reliability in operation. Let us summarize the data for calculating the net discounted price of investment projects in the table 1.

**Table 1 – Net present value of the project (NPV), including capital structure**

Year	Investors` ionic and operational finance flows in this period (St), thousand USD	Investment money's flows periods (Ft), thousand USD	Borrowed funds to total capital (d), %	Coefficient of discount assets of the company (G1)	The discount rate and the debt financing (G2)	Income tax rate, % (s)	Cost of capital, share % (EC)	Cost of borrowed capital, share % (et)
Project 1								
1	0,00	-74 679,64	75,25	0,08628	0,49477	24,00	34,92	65,11
2	23 182,57	- 33 920,08	29,10	0,24775	0,49477	24,00	34,95	65,12
3	61 256,63	0,00	29,10	0,24775	0,49477	24,00	34,95	65,12
4	99 968,63	0,00	29,10	0,24775	0,49477	24,00	34,95	65,12
5	137 542,24	0,00	29,10	0,24775	0,49477	24,00	34,95	65,12
6	151 334,79	0,00	29,10	0,24775	0,49477	24,00	34,95	65,12
Project 2								
1	101 762,00	-172736,00	80,00	0,04005	0,55987	30,00	20,01	79,97
2	127 223,00	126 223,00	80,00	0,04005	0,55987	30,00	20,01	79,97
3	122 091,00	122 091,00	80,00	0,04005	0,55987	30,00	20,01	79,97
4	117 459,00	117 459,00	80,00	0,04005	0,55987	30,00	20,01	79,97
5	116 582,00	116 582,00	80,00	0,04005	0,55987	30,00	20,01	79,97
Project 3								
Direction 1								
1	2 548,87	2 100,00	50,00	0,2600	0,3700	24,00	50,00	50,00
2	2 548,87	2 100,00	50,00	0,2600	0,3700	24,00	50,00	50,00
3	2 547,23	1 206,55	50,00	0,2600	0,3700	24,00	50,00	50,00
Direction 2								
1	1 503,30	2 100,00	50,00	0,2600	0,3700	24,00	50,00	50,00
2	1 503,30	2 100,00	50,00	0,2600	0,3700	24,00	50,00	50,00
3	1 217,18	1 206,55	50,00	0,2600	0,3700	24,00	50,00	50,00

One of the main conditions for the implementation of investment projects is the presence of a positive balance at each stage of calculations. In the case where at some stage the real balance of investments will be negative, it suggests that a particular project in this configuration can't be performed regardless of the available integral indicators of profitability. Meanwhile, when the available profitability indicators become high, all the proposed projects can be implemented.

Often, additional investments to invest in new projects can change the level of financial risk of machine-building enterprises. This indicator varies both from the internal conditions that determine the activity of machine-building enterprises, and from the indicators of the financial market. Thus, the change in interest rates leads to a change in the required rate of return for shareholders on the amount of investment, which, of course, can not affect the value of capital.

At the same time, the non-specificity of the proposed investments is one of the key problems in the calculation of the profitability of investment projects and in the selection of discount discounts. But in some cases, risks are ignored in the evaluation of investment. Then the risks are considered intuitively, and the results take the form of specific assessments [Block, De Vries, Sandner, 2010].

Thus, the necessary financial solutions, which are crucial for the machine-building enterprise, as the analysis shows, are usually long-term and can be associated with an alternative to investment projects. This choice is based on the calculation of the predicted values of the reduced net effect. The qualitative level of calculation will depend on the reliability of cash flow forecasts and the level set by the Manager of the acceptable value of investment efficiency.

It is necessary to take into account the possible risk indicators in the projects under consideration, adjusted for the discount rate – the main parameter of the project. And the greater the volume of the discount, the lower the value of the expected cash receipts, i.e. the adjustment to the discount rate can affect the amount of profit pledged in the project.

In a situation where the forecasting of financial flows shows uncertainty, the value of the project from the investor's point of view, as a rule, is reduced, so projects with a high level of risk include a higher discount rate. Therefore, when calculating the discount rate, you must add a risk premium. Every enterprise of machine-building complex set the acceptable level of risk individually. The decisive sign in this case may be information concerning the implementation of such investment projects.

Thus, investments aimed at updating the range of products will ensure the profitability of the project, which guarantees a high return.

For its part, the renewal of the range will subsequently provide the machine-building plant with cost coverage by increasing cash flows from economic activities, making a profit, and thus, the implementation of the investment project will be achieved.

In general, summarizing the results, we can state the following:

1. On the basis of generalization of scientific points of view on management of investments the definition of investment policy of subjects of a machine-building complex that gives the chance to describe the place and a role of investment policy in system of the economic relations is specified and added.

2. The need for machine-building enterprises to invest in conditions of limited financial resources is proved; the position that in the current period is justified, venture capital, along with crowdfunding and crowdfunding, more than other sources of investment make it possible to enhance the innovative activity of the enterprise machine-building complex, to maintain a presence in the market; found that we should expect a step-by-step growth of crowdfunding and crowdfunding, while the growth will be due to the change in the role of investment instruments of the machine-building complex. Investment will allow to update outdated fixed assets, restructure the organizational structure of enterprises, and

improve management efficiency [Lazonick, Mazzucato, 2013].

3. The organizational and economic mechanism of formation of investment policy at the enterprises of machine-building complex, the structure of which includes the following characteristics: the interconnection of subjects, functions, methods and technologies of investment policy management, the objectives of economic activity, which will ensure the current management of the enterprise;

4. The proposed method of evaluation of the innovation project, the use of which will allow to plan, develop and implement investment, to efficiently allocate financial resources of machine-building enterprises between their ongoing activities and major capital investment; to assess the financial risk level for particularly large projects; to choose the most appropriate strategy of attracting funds to subsidize investment in innovation activities; to determine the effectiveness of a project in comparison with different variants of specific projects.

5. The algorithm of implementation of investment policy of the machine-building enterprise which characteristic feature is determination of level of investment potential at the expense of substantial management of its investment sources is offered.

The scientific views on the management of the investment policy of the classics of economic thought are summarized, the investment theme is analyzed, which is reflected in the works of well-known scientists who focus on the study of the research topic, which made it possible to clarify the definition of the investment policy of the subjects of the machine-building complex;

It is concluded that the investment policy of machine-building enterprises is seen as a complex, interrelated and interdependent set of activities aimed at their further development, obtaining positive effects from investment.

The main sources of financial support of the enterprise of machine-building complex which in the conditions of limitation of financial resources give the chance to activate its investment activity, to keep presence in the market are revealed. From the point of view of the topic of our research, these sources, in particular, are supplemented by such tools as crowdinvesting and crowdfunding - relatively new for machine-building enterprises of our country.

A separate source of investment includes venture capital investments - funds placed in new projects with a high level of risk with the expectation of the effectiveness of several or one of them to extract high profits.

It is concluded that these areas as very promising will develop in accordance with modern realities.

## **Conclusion**

Organizational and economic mechanism of investment policy of machine-building enterprises is seen as a set of components (tools, methods, methods, procedures, rules) of investment management for the production of engineering products, the introduction of new technologies, products, organizational and technical solutions, and other results of the enterprise.

It is noted that the organizational and economic mechanism of investment policy of enterprises of machine-building complex is an essential tool to promote investment policy, ensuring the effective planning and implementation of investment projects.

An investment project has been developed to update the fixed assets of a machine-building enterprise, adapted to this enterprise.

The high profitability of the project for the renewal of fixed assets will subsequently provide coverage of costs by increasing cash flows from economic activities, profit, and thus, the effective implementation of the investment project will be achieved.

The positive experience of the project application will allow to rationally allocate financial resources of the enterprise; to assess the level of financial risks for particularly large projects; to choose the most appropriate strategy for raising funds to subsidize investment activities; to determine the effectiveness of a project in comparison with various options for specific projects.

The algorithm of strategy of investment development of the machine-building enterprise of the Moscow region is offered.

Given the specifics of the functioning of the engineering industry, the use of the algorithm will make it possible to identify factors that can affect the implementation of the investment project.

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## Организационно-экономический механизм формирования инвестиционной политики машиностроительных предприятий

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## Аннотация

В современных условиях роль и значение инвестиционной политики, проводимой машиностроительными предприятиями, возрастают. Во-первых, инвестиционная политика машиностроительных предприятий представляет собой сложный комплекс взаимосвязанных и взаимозависимых мероприятий, направленных на их дальнейшее развитие, получение

положительного эффекта от инвестиций. Инвестиционная политика имеет целью создание условий для оптимизации инвестиционных ресурсов, рационального сочетания различных финансовых источников, достижения высоких интегральных показателей эффективности инвестиционных проектов, а в целом – обеспечение экономически обоснованной эскалации производства. Во-вторых, невозможно создать условия для устойчивого роста машиностроительных предприятий без устранения отставания в инвестиционном развитии, что способствовало бы укреплению отрасли. В то же время инвестиционная политика имеет первостепенное значение для удовлетворения потребностей государства и бизнеса в современной машиностроительной продукции. Отдельный источник инвестиций включает в себя венчурные инвестиции, то есть средства, размещенные в новых проектах с высоким уровнем риска с ожиданием эффективности нескольких или одного из них для извлечения высокой прибыли. Выявлены основные источники финансовой поддержки предприятия машиностроительного комплекса, которые в условиях ограниченности финансовых ресурсов дают возможность активизировать его инвестиционную деятельность, сохранить присутствие на рынке.

#### Для цитирования в научных исследованиях

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#### Ключевые слова

Менеджмент, цифровая экономика, образование, компания, инвестиции, финансы.

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