

Technique of Determination of Optimum Volume and Structure of the Investment Capital of the Innovative Project

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Abstract

Economic activity of the enterprise shares by the following types: operating (production), investment and financial activities. The sequence of stages of managing of the enterprise and interrelation of all three kinds of activity consists in the following:

Originally there is an investment of the raised funds on property purchase. Then there is a transformation of initial goods (resources) to the ready products, accompanied by an exchange between spheres of payments and investments (transfer of cost of resources on products). And, at last, sale of finished product that causes a counter flow of financial means from the sphere of investments into the sphere of payments (a deinvestirovaniye at a rate of depreciation, costs of the used materials, work, the credits and other resources) is realized.

Keywords: innovation activities, innovation policy, innovation strategy, company, innovation project

1. Introduction

Basis of the organization of finance of the enterprises is existence of financial resources in sizes, sufficient for implementation production and commercial, activity. The financial relations of the enterprises are under construction on a number of the general and specific principles. First of all it is necessary to refer the principle of planned character, commercial calculation, the principle of providing financial reserves, the principle of differentiation of means of the primary and investment activity, sources of a forkmirovaniye of current assets to them on own and loan, the principle of their safety (Tronin, 2011).

The analysis of activity of the enterprise make by means of the following sources of information:

- 1) Data of accounting and accounting reports.
- 2) Norms and standards of expenses of material and power, labor, financial resources.
- 3) Legal, tax and financial information.

Listed and other types of information are necessary both to the investor, and the enterprise which is carrying out the innovative project at all stages of work with it.

In economic theory and economic practice for solving problems on the analysis of economic opportunities enterprises widely used method of assessing the financial stability that characterizes the ability of the subject to provide economic production process (Abramov, 2000):

- 1) Working capital;
- 2) Working capital and long-term loans;
- 3) Working capital, long-term and short-term loans

2. Method

One of the main problems of the analysis of financial stability of the enterprise is to determine the extent of coverage and costs of their own and borrowed sources of their formation, as well as the relation volumes of equity and debt. This analysis is conducted on the basis of the financial statements. Using the methodology of this analysis reveals the compliance or noncompliance (excess or deficiency) means for generating stocks (Tronin, 2011).

One of such techniques is "the golden rule of financing". According to this rule it is necessary that expensive subjects of property with a long length of life were got at the expense of own capital or, that long-term connected in the enterprise fixed assets and part of working capital were financed from long-term sources.

If the results received as a result of the analysis do not conform to the standards, it is possible to predict that the risk of implementation of the innovative project at such enterprise will be rather great. And the enterprise needs to reconsider sources and financing terms, to increase a share of own capital, to change conditions of deliveries, system of calculations, etc. (Kuchkovskaya, 2009).

The following list of the economic indicators characterizing an evaluation of a financial position of the enterprise (Table 1) is provided in Methodical recommendations.

Table 1. The primary groups of indicators characterizing economic activity of the enterprise (this is an example of Table 1)

Group of indicators	of	Group structure	The purpose of this group
Indicators of financial stability	of	Independence coefficient (own means/property value)	Characterize degree of security of interests of investors and creditors.
		Specific weight of borrowed funds (debt/property value sum)	
		Ratio of borrowed and own funds (debt sum/own means)	
		Specific weight of receivables in property value (receivables/property value)	
Solvency indicators	of	Specific weight of own and long-term borrowed funds in property value ((own means + long-term loans)/property value)	Reflect possibility of the enterprise to extinguish short-term debt the easily realized means.
		Absolute liquidity index ((money + short-term financial investments)/short-term obligations) General coefficient of a covering ((money + short-term financial investments + receivables + stocks and expenses)/short-term obligations).	
Indicators of business activity	of	General coefficient of turnover (proceeds from realization/property value)	Characterize efficiency of use of own enterprise assets.
		Turnover of stocks (prime cost of realized production/cost of stocks and expenses)	
		Turnover of own means (sales proceeds/own means)	
Profitability indicators	of	Coefficient of profitability of the capital (balance profit/property value x 100%; pure profit/property value x 100%).	Characterize profitability of the enterprise.
		Coefficient of profitability of own means (balance profit/own means x 100%; pure profit/own means x 100%).	
		Coefficient of profitability of business assets (balance profit/(main appliances + current assets) x 100%; private profit/(main appliances + current assets) x 100%).	
		Profitability of financial investments (the income on securities and from share participation/cost of financial investments x 100%).	
		Coefficient of profitability of sales (balance profit/sales proceeds of production x 100%; pure profit/sales proceeds of production x 100%).	

For the analyzed enterprise it is expedient to consider calculated values of indicators in dynamics that will allow to reveal tendencies of change of an economic situation during the period preceding an innovation (Fisher, 2012).

The revealed tendencies are considered by preparation of the innovative project:

1) At negative tendencies the reasons are established, actions are developed and expenses on stabilization of a financial state are estimated;

2) Opportunities and consequences of transfer of the general negative economic situation of the enterprise (the separate reasons) on future innovative project that is considered during the planning and decision-making on an innovation are analyzed.

Such approach to an assessment of financial stability of the enterprise, according to authors, possesses the following main shortcoming. Each participant of the project and as crediting banks and lessors can have own idea of limit values of above-mentioned indicators, and, therefore, and of the innovative capacity of the enterprise. Besides, to reveal resultant function of an assessment of the enterprise from a large number of indicators it is rather difficult and labor-consuming (Holt & Barens, 2011).

To the manager developing the innovative project, it is necessary to make the competent administrative decision on a choice of its ways of financing.

To the main types of investments directed on innovative activity, investments into fixed capital and intellectual investments belong.

For implementation of the innovative project to the enterprise attracts own and loan capital. The structure of these capitals is given below in Table 2.

Table 2. Main sources of investments of innovative activity of the enterprise (this is an example of Table 2)

Source of investment	Source components	Type of the capital
Own financial means	The profit, the saved-up depreciation charges, the sums paid by insurance bodies in the form of compensation for damage.	Borrowed Own
The raised funds	Means from sale of shares, charity and other contributions, the funds allocated by higher stock companies, industrial financial groups on a gratuitous basis.	
Allocations	Means of federal, regional and local budgets, funds of support of the innovations, provided on a gratuitous basis.	
Foreign investments	Financial or other participation in authorized capital of cooperation management enterprises, and also direct monetary investments of the international organizations and financial institutions, states, enterprises and organizations of various forms of ownership and individuals.	
Borrowed funds	The loans granted by the state on a returnable basis, the credits of foreign investors, leasing, bonded loans, the credits of banks and other institutional investors (investment funds and the companies, the insurance companies, pension funds), bills and other means.	

In the Russian Federation there are two restrictions which need to be considered:

- Deficiency of the share capital as a result of low level of the income of the population and low appeal of long-term investments;
- The high cost of the loan capital, including percent on the credits and costs of providing guarantees.

The financial market of investments represents set of the markets of the capitals, securities, bank loans and leasing.

The securities market provides to the businessman investment means due to issue of new actions which, as a rule, take place in the open market and in a private order (certain investors). Private placement of shares is connected with target financing of the innovative project by one or several investors who in details control subsequently activity of object of an innovation (Honk, 2011).

If issue of new actions does not cover need for financial means for investments into innovations, so the go to the market of bank loans.

The market of bank loans provides borrowed funds for a certain term from one to five years - the short-term loans, over five years - long-term loans and for a payment (percent). The basis of an interest rate is made by a so-called basic rate by which are guided as the minimum payment at an assessment for the loan. Except banks other financial institutions can carry out long-term financing of innovations: insurance companies, investment funds, leasing companies, etc.

Selling the new stocks, the managing subject, as a rule, pays further on them more, than on bank loans. Besides, the percent on loans joins in costs of production and its size is subtracted from a gross income, reducing taxable basis and the corresponding payments (Ilyenkova, 2001). Thus, bank loans in principle manage to the managing subject cheaper, than financing due to issue of new stocks. Receiving long-term loans is facilitated by also public policy of decrease in a bank interest rate.

We will consider leasing, as the mean of replacement most widespread presently morally and physically outdated equipment of the industrial enterprises in more detail (Sheremet, 1998).

According to the Federal Law of 29.10.98 № 164-FZ leasing - this type of investment, aimed at investing borrowed funds when under financial lease (leasing) the landlord (lesser) agrees to acquire ownership of the property from the contract due to certain of the seller and give the property to the tenant (lessee) for temporary use for business purposes (Schumpeter, 1982).

3. Results

The leasing property is used by the lessee only in the enterprise purposes and got by the lessor at the seller of leasing property only on condition of its transfer to leasing to the lessee. In the leasing contract, besides transfer of the specified property to temporary possession, the wide set of various services (service by the lessor of the equipment, the training, necessary for its service, etc.) is usually provided. Upon termination of the term of the contract of leasing or under the additional agreement are possible: purchase by the lessee of leasing property, prolongation of term of leasing (conclusion of the new contract), return of leasing property to the lessor (leasing firm), etc.

If bank loans manage to the managing subject cheaper, than issue of new actions, that, raising borrowed funds, it is expedient to make a choice between two options (Sheremet & Saifulin, 2012):

- 1) Use of loans (bank credits). In this case the fixed assets acquired at the expense of the loan, become enterprise property.
- 2) Leasing use as forms of attraction of borrowed funds. In this case fixed assets remain property of the lessor if other is not provided by terms of the contract.

If the gained effect has negative value, it is better to use credit resources To the contrary, if the gained effect has positive value, it is necessary to use leasing (Bakanov & Sheremet, 2011).

After definition of sources of financing of the innovative project analytical justification of the size of the investments demanded for its realization, that is a real assessment of the actual volume of own means and volume of necessary means of loan financing is necessary. It is best of all to present borrowed funds in the form of structure, comparing its various components in size of the financial expenses connected with service of this or that source.

The following model of justification of optimum structure of means of financing of the innovative project is given in D. A. Endovitsky's work .

Above-mentioned indicators are estimated on the next formulas:

$$FI = \frac{ZK}{CK}; ROE = \frac{P}{CK}; ROI = \frac{P}{I} \quad (1)$$

where ZK - size of the loan capital, rub.;

CK- the size of means from external (due to issue of actions) and internal (depreciation and profit) sources of own capital of the company, rub.;

H - the size of design profit to the taxation and payment of percent, rub.

The indicator of ROE estimated with use of net profit and after payment of percentage payments, it is possible to present in a next look:

$$ROE = \frac{(P - r \cdot ZK) \cdot (1 - tax)}{CK} \quad (2)$$

where tax - rate of a tax and other assignments from enterprise profit;

r - the average weighed rate of percent on borrowed funds of financing.

It is possible to define dependence of an indicator of ROE on profitability of the invested capital (efficiency of capital investments) and a financial leverage (an indicator of structure of the invested capital):

$$ROE = \frac{P \cdot (1 - tax) - r^* \cdot ZK}{CK} = ROI + (ROI - r^*) \cdot FI \quad (3)$$

where r^* - the posttax rate of percent counted as $r \cdot (1 - tax)$.

4. Discussion

At the first stage it is necessary to estimate gross requirement in the capital and to define the greatest possible share of own capital in the total value of the funds allocated for financing of the innovative project.

The second stage consists in an assessment of financial capacity of the enterprise. The assessment of financial potential is offered to be carried out regarding sufficiency at the enterprise of financial and economic resources for effective providing not only the current production activity, but also innovative (Table 3).

Indicators of security of production and economic stocks and expenses, and also costs for realization of strategy of innovative development by sources of their formation ($\pm\Delta C$; $\pm\Delta T$; $\pm\Delta\Sigma$) are base for classification of financial capacity of the enterprise (Harin & Kolensky, 2010).

At determination of financial potential use a three-dimensional (three-component) indicator:

$$W = \{W_1(x_1); W_2(x_2); W_3(x_3)\} \quad (4)$$

where:

$$x_1 = \pm\Delta C; x_2 = \pm\Delta T; x_3 = \pm\Delta\Sigma.$$

Values of the $W(x)$ function are defined as follows:

$$W(x) = 1, \text{ if } x \geq 0;$$

$$W(x) = 0, \text{ if } x < 0.$$

Definition on the basis of the offered method the characteristic of financial potential allows to check correctness of the chosen direction of innovative development from positions of a current and further financial state of the enterprise.

The following stage consists in definition of options of attraction of sources of financing of the loan capital. Each option is represented in the form of structure of the investment capital. Criteria of an assessment at this stage are the prices of the investment capital (WACC), a payback period of investments (RV) and a ratio profitability of own headband with investment risk (λ) (Chetyrkin, 2009).

Table 3. Calculation of sources of formation of results and expenses for ensuring production and innovation introduction (this is an example of Table 3)

Indicator	Formula
	$\pm\Delta c = CC - A - Z - \sum Z_e$
	where: C_c - sources of own means (a result of section III of balance "The capital and reserves");
Surplus (+) or a shortcoming (-) own current assets for ensuring production and for introduction of the innovative project	A - fixed assets and investments (a result of section I of balance "Non-current assets"); Z - stocks and expenses (p. 210 + p. of 220 section II of balance "Current assets"); $\sum Z_e$ - the expenses necessary on development of innovative technologies.
Surplus (+) or a shortcoming (-) own current assets and long-term loan sources of formation it is production – economic stocks and introduction of the innovative project	$\pm\Delta T = (\Delta c + K_d) - Z - \sum Z_e$ where: K_d - the long-term credits and zakemny means (a result of section IV of balance "Long-term obligations").
Surplus (+) or a shortcoming (-) the total value of the main sources for formation of stocks and expenses and introduction of the innovative project	$\pm\Delta\Sigma = (\Delta c + K_d + K_r) - Z - \sum Z_e$ where: K_r - the short-term credits and borrowed funds (a result of section V of balance "Short-term obligations"), no more than 50% of current assets (a result of section II of balance "Current assets").

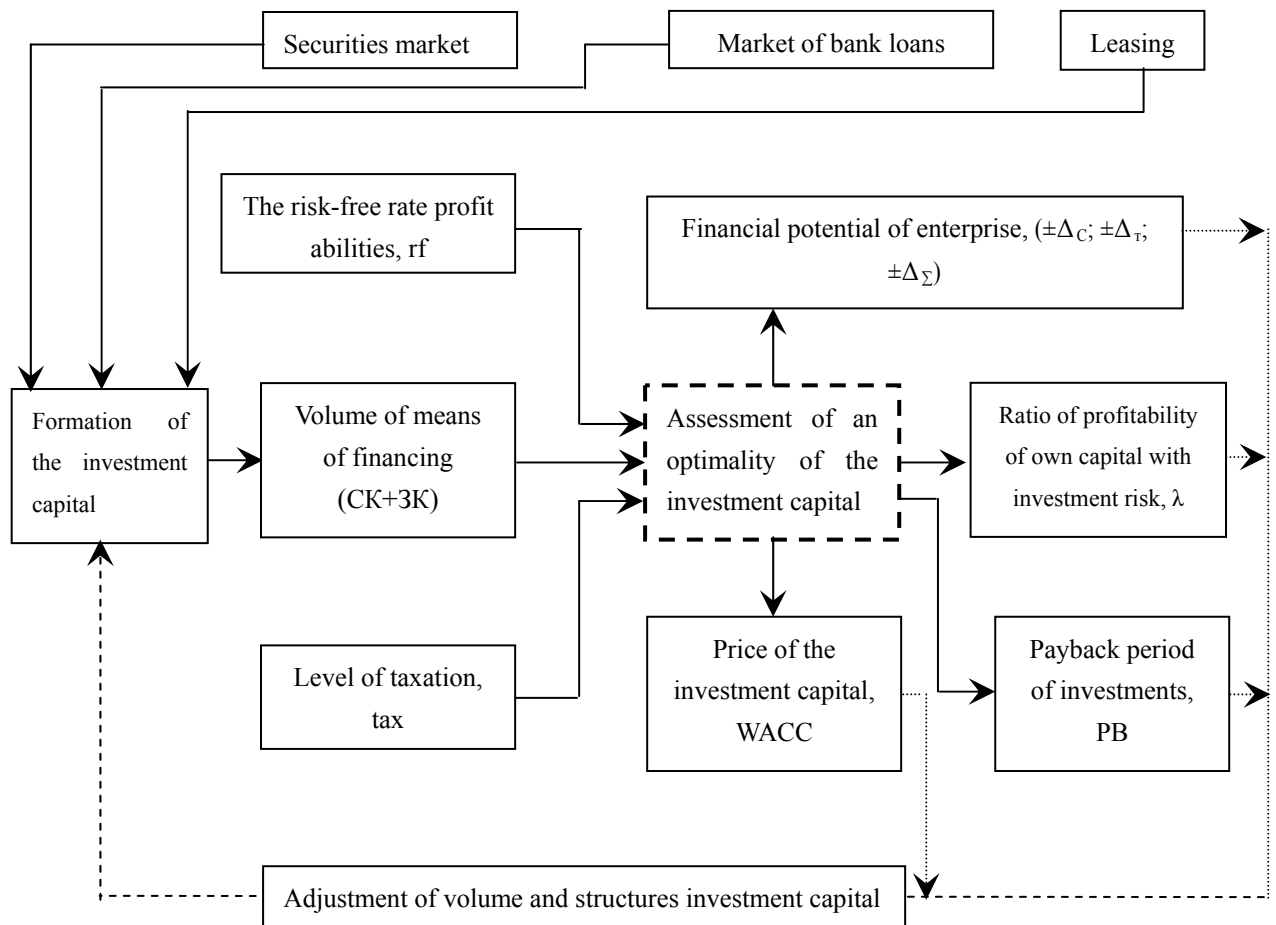


Figure 1. Model of scoping and structure of the investment capital of the innovative project (This is an example of figure 1)

According to this approach the main characteristics of financial capacity of the enterprise (Table 4) are offered.

Table 4. Characteristic of company’s financial potential (this is an example of Table 4)

Values of the $W(x)$ function	Sources of a covering of expenses of the innovative project	Characteristic
$W = (1,1,0)$	Own means	High security with own means. The innovative project can carry out the enterprise without external loans
$W = (0,1,1)$	Own means plus long-term credits	Normal financial security of production with necessary resources. Effective introduction of the innovative project requires use of some volume of borrowed funds.
$W = (0,0,1)$	Own means plus long-term credits plus short-term credits	Satisfactory financial support of the current production stocks and expenses. Implementation of the innovative project requires attraction of considerable financial means from external sources.
$W = (0,0,0)$	No	Deficiency or lack of sources of formation of expenses for the innovative project

Value of the price of the investment capital find on a known formula of average weighed (WACC):

$$WACC = \sum_{i=1}^n k_i \cdot p_i \quad (5)$$

where:

k_i - cost of i of a source of financing;

p_i - share of i of a source of financing in the total amount of financing.

Use of an indicator of WACC is defined by quite concrete rule: the enterprise cannot make any investment decisions with profitability level below the current value of the price of the investment capital (Kovalev, 1995).

As WACC indicator in the conditions of the inflation, an unstable political situation, sensitivity of the main macroeconomic indicators to changes in the international markets of the Central Bank and the loan capital can strongly vary. It is recommended to count the limit price of the capital (MCC). It is the price of the capital estimated on the basis of the greatest possible values of expenses on providing demanded structure of means of financing and, as a rule, focused on future conditions of the financial market (Degtyarenko, 1997).

If as a result of use of additional resources of financing changes not only the capital structure, but also the price of its separate components, is recommended to count separately the limit price for each source of financing.

The ratio of profitability and own capital with investment risk (λ) count on the following formula:

$$\lambda = \frac{ROE}{IR} = \frac{(P - r \cdot ZK) \cdot (1 - tax)}{CK} \div \frac{(r - r_f) \cdot ZK}{CK + ZK} \quad (6)$$

5. Conclusion

The last stage consists in adjustment of volume and structure of the investment capital. For all options of volume and structure of the investment capital as criteria of optimality indicators, WACC, PB and λ pay off. With use of criteria of a maximum of an indicator λ and RV minimum and as above-mentioned criteria the optimum combination of the means arriving on financing of the innovative project is defined.

Thus, in a technique of the analysis and an assessment of the innovative project there is the new effective tool, allowing to determine the optimum volume and structure of the investment capital. By means of it the enterprise can eliminate considered alternatives impracticable (from the point of view of financial security) innovative projects and to avoid further a problem of the missed benefit caused by their freezing.

References

- Abramov, S. I. (2000). *Investing*. M.: CSE.
- Bakanov, M. I., & Sheremet, A. D. (2011). *Theory of Economic Analysis*. M.: Finance and statistics.
- Chernov, V. A. (2009). *Analysis of commercial risk*. Moscow: Finance and Statistics.
- Chetyrkin, E. (2009). *Methods of financial and commercial calculations*. Moscow: Finance and Statistics.
- Degtyarenko, V. N. (1997). *Evaluating the effectiveness of investment projects*. M.: Expert bureau-M.
- Endovitsky, D. A. (2001). *Complex analysis and supervision of investment activities: Methodology and Practice*. M.: Finance and Statistics.
- Fisher, P. (2012). *Foreign Direct Investment in Russia: The revival of industry strategy*. Moscow: Finance and Statistics.
- Gilyarovskaya, L. T., & Endovitsky, D. A. (1997). *Financial and investment analysis and audit of commercial organizations*. Voronezh: Publisher VGU.
- Harin, A. A., & Kolensky, I. L. (2010). *Managing Innovation: In the 3 books*. Kn.1. Basis for the organization of innovation processes - M.: Higher School.
- Holt, R. N., & Barends, S. B. (2011). *Investment Planning: Lane*. From English. M: Business Ltd.
- Honk, Y. (2011). *Investment planning and control: Per*. From English. Moscow: Economics.
- Ilyenkova, S. D. (2001). *Innovation management*. M.: INFRA-M.
- Katchalov, P. M. (2002). *Management of economic risk*. M.: Science.
- Kovalev, V. V. (1995). *Financial Analysis*. M.: Finance and Statistics.

- Kuchkovskaya, N. V. (2009). Regional aspects of the social responsibility of transnational corporations in Russia. *Regional economy: The theory and practice*, 1(94), 15-20.
- Schumpeter, J. (1982). *Theory of Economic Development*. M.: Progress.
- Sheremet, A. D. (1998). *Investment management*. M.: Graduate School.
- Sheremet, D., & Saifulin, R. S. (2012). *Methods of financial analysis*. Moscow: INFRA-M.
- Tronin, S. A. (2011). Methods of determining the optimal size and structure of the investment company's capital. *Journal of Modern Economy: Problems and Solutions*, 3(15), 109.
- Tronin, S. A. (2011). Principles of investment planning at the enterprise. *Journal of Modern Economy: Problems and Solutions*, 2(14), 101.

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