

METHODS OF MODELING INVESTMENT AND INNOVATION STRATEGY OF ENTERPRISES

Statement of the problem. Investment and innovation strategy - the formation of principles and rules of choice for their innovation investments and implementation of measures for their development introduction and spread, leading to the creation of competitive advantage and encourage the strategic objectives of the enterprise [5].

The modern economy characterized by a sharp aggravation of competition producers, due to globalization, freedom of movement of capital and labor, increasing diversification of consumer requests, reducing product life cycles, a sharp increase in the role of NTP factors in the economic growth of individual enterprises and national economies as a whole. Before the industrial enterprises face the challenge to form investment and innovation strategy, based on a system approach, that provides a definition of innovation and investment opportunities of enterprise (internally self) and external factors. The factors affect the implementation of investment and innovation goals at the species or subspecies of economic activity (level of external sources and constraints) in order to optimize their interaction mechanisms.

Analysis of recent research and publications. Work on developing models of strategic analysis and choice of strategic alternatives conducted by many domestic scholars, including Shershnovoyi Z.E., Oborsky S.V.[11] Artemenko L.P., Dougan L.E.[4], Karakay Y. An important contribution to the theory and methodology of strategic analysis and formulation of strategic business has positions overseas experts: H.Rou, R. Mason, K. Dikel, Galbraith, I. Ansoff, J. Ackoff, J. Steiner et al. To date, many models developed and developing innovative investment strategies based on the strategic positioning of companies in various signs and indicators.

However, problems remain poorly understood complex evaluation and comparison of the internal potential of the company with the potential to level the industry to identify and optimize the sources of formation, development and distribution of investment and innovation resources in achieving strategic goals.

Formulation of the problem. The aim of the investigation is to develop theoretical, methodological guidelines to justify strategic alternatives of investment and innovation on the basis of comprehensive analysis and evaluation innovation and innovation capacity at the enterprise level and area of its operation.

The main material of the study. To justify the investment and innovation strategies on the basis of the available information suggested a modified model SPASE analysis, which is based on the principle of combining in one plane coordinate internal and external factors that influence the choice of development strategy, including investment and innovation. The corresponding figures are characterized by a set of criteria that depend on their own vision of the company's management strategy for further development, strategic goals and peculiarities of the alternatives.

Formation of a model is to assess the ability of companies to attract investment resources to generate and innovate based on internal capabilities and the conditions prevailing during the development of the sector at the regional level. As innovation and investment activity is a means of competition on long-term corresponding position on the matrix makes it possible to determine the effectiveness of strategic alternatives investment and its impact on the competitive position of the company in this area.

The analysis is based on a claim that the strategic position of the company in the direction of investment and innovation depends on four groups of factors (Fig. 1):

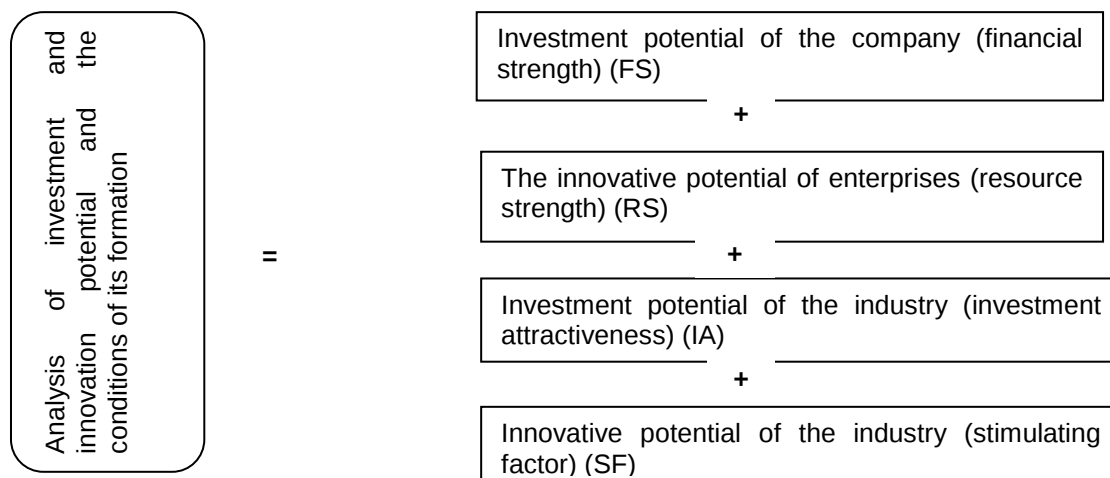


Figure. 1. Components analysis in the study of innovative alternative investment strategies (authoring)

Investment potential of the company reflects the level of ability of enterprises to make investment and innovation at the expense of own and borrowed (from external sources) financial resources. [10, p. 299]

The innovative potential of the company - a combination of explicit and implicit business opportunities and ensure the implementation of a innovation by bringing material, financial, scientific and technical information resources. They based on experience of the results of scientific and technical works, inventions, design development, sample new technology and products lead to consolidation of financial results and the conquest of competitiveness on both domestic and foreign markets. [7, p. 15].

Investment potential of the industry reflects its ability to generate resources for investment by attracting foreign investors. The innovative potential of the industry's ability to self-determine on a more qualitative basis, depending on the state of its lifecycle and quality impact on technological structure of the economic system [9,p. 307].

The proposed model is a combination of SWOT and SPACE analysis and allows you to:

1. Simplify and visually interpret the decision of investment and innovative solutions based on a combination of quantitative and evaluation of internal and external factors that influence the development and implementation of investment and innovation strategy.
2. Determine the level of investment and innovation on the market in relation to key competitors.
3. Combine the factors described various indicators, including qualitative.
4. Identify priority strategic actions enterprises under the influence of all factors based on the vector.
5. Identify the strengths and weaknesses of the company in respect of resource and financial support of innovative development, and the opportunities and threats that must be considered in the formation of strategies for adaptation.
6. Provide strategic change prediction market based on current trends.

Shortcomings that require further research, have difficulty in selecting key indicators that more fully characterize the criteria matrix, including the selection of reference values used to define objects as points. This is due to the peculiarities of individual sectors and economic activities, the level of differentiation of the enterprise, and personal goals leaders that shape business strategy.

Features of the proposed technique are subject to certain principles:

1. Methods of selecting indicators and their weights determined in accordance with the strategic goals of the company.
2. Indicators that form the basic criteria of the matrix must be reduced to a single comparative value. To analyze different in its purpose and the method of measuring the performance evaluation rating, based on the determination of the coefficients of the enterprise (industry) specific types of resources and efficiency.
3. Provide regular opportunities repeating the procedure of formation (replacement) criteria for changes in external or internal economic conditions and to compare the performance of different companies.
4. Simplicity and accessibility calculations based on statistical and financial reporting.

Authors SPACE-analysis suggests coordinate the division of the scale from -6 to +6 or 0 to 6. The strategic position on proposed matrix, based on ratings of key competitors to develop. In connection with this a matrix of indicators we used an adapted Harrington desirability scale at which individual performance companies can get 6 ratings reference, very high, high, satisfactory, low very low and critical, which are developed by us are converted to scale scores (Table 1.).

The main stages of the analysis is that the following steps:

1. Establish strategic objectives of the enterprise.
2. Clarifying the purposes of investment and innovation.
3. Ddefinitions level of investment and innovation potential. Given the different approaches to determining the level of investment and innovation potential, we proposed target approach, which consists in determining the level of capacity is expected to provide potential properties subject to assessment of positive (or negative) result in the existing system of external constraints, taking into account the ability of the media to develop [2, p. 23].
4. Determination of integrated assessment of investment and innovation potential.

The algorithm of the integral evaluation is based on general principles of method, which is used by the Institute for Economic Research and Policy Consulting to determine the rating of Investment attractiveness of regions [6, p. 321] and includes the following steps:

- Input data for each evaluation criterion serves as a matrix, in which the tapes recorded number of parameters ($i = 1, 2, 3, \dots, n$), and in columns - number of comparable companies (branches) ($j = 1, 2, 3, \dots, n$);
- To determine the standardized values, we use the method proposed min-max, which allows you to consolidate all data into a range between 0 and 1.

$$X_i = \frac{X_n - X_{\min}}{X_{\max} - X_{\min}} \quad (1.1),$$

where, X_i -standardized value of the i -th index of the investigated companies

X_n -statistic value for the company (industry)

$X_{\min}$ and $X_{\max}$ - minimum and maximum values of respectively.

As the maximum and minimum performance indicators should choose comparative companies (branches), or interval within which the company is able to achieve their investment objectives.

In summary the results of evaluation of quantitative and qualitative indicators into a single measure, we developed a point system parameter estimation (see Table. 1.1). The following scoring system is based on using an adapted numerical scale of G.Harynhton [8].

Table 1.1

Scoring of standardized parameters of investment and innovation potential							
Indicators	rating						
	reference	very high	high	average	low	very low	critical
Range of indicators on a scale Harrington, Xi (x; y)	0,91-1	0,80-0,90	0,79-0,64	0,63-0,37	0,36-0,20	0,19 -0,10	0,09-0
points, B _i	6	5	4	3	2	1	0

Determination of weights is carried out within a selected set of indicators with a certain level of aggregation. Weighting factor of each level is determined by an expert for the purposes of analysis at the discretion of management regarding prioritization of individual factors for analysis. Weighting factor is determined within each of the factors in the range from 0 to 1. Since the parameters used to build the matrix is reduced to a generalized values (points), it is proposed to use a simple linear weighting method using the formula:

$$K_i = B_i \cdot w_i, (1.2)$$

where K_i - weighted value of the i-th parameter
w- Weight index rate within the population.

In order to simplify the analysis and separation of the main strengths and weaknesses of potential locations proposes that the integrated performance of each component within the set at two levels - at the individual components of each factor and to determine the level of integral index factor by the formulas:

$$P_i = \sum_{k=1}^n K_i \cdot w_k (1.3)$$

where R_i - integral index factor variable capacity;
w_k – weighting.

Thus, at this stage we have benchmarks evaluation of individual factors that increase or reduce investment and innovation criteria in the analysis and can be used to determine the reserves to improve the strategic position of the company.

The value of the integral index is given by:

$$S = \sum_{i=1}^n P_i \cdot W_p, (1.4)$$

where S - integral indicator location on the matrix of a certain criterion basis.
W_p - weighting factor variable in the system test [1].

A result of weighted points defined by formula (1.4) characterizes the situation and coordinates the strategic situation of the company in the field (Fig. 2).

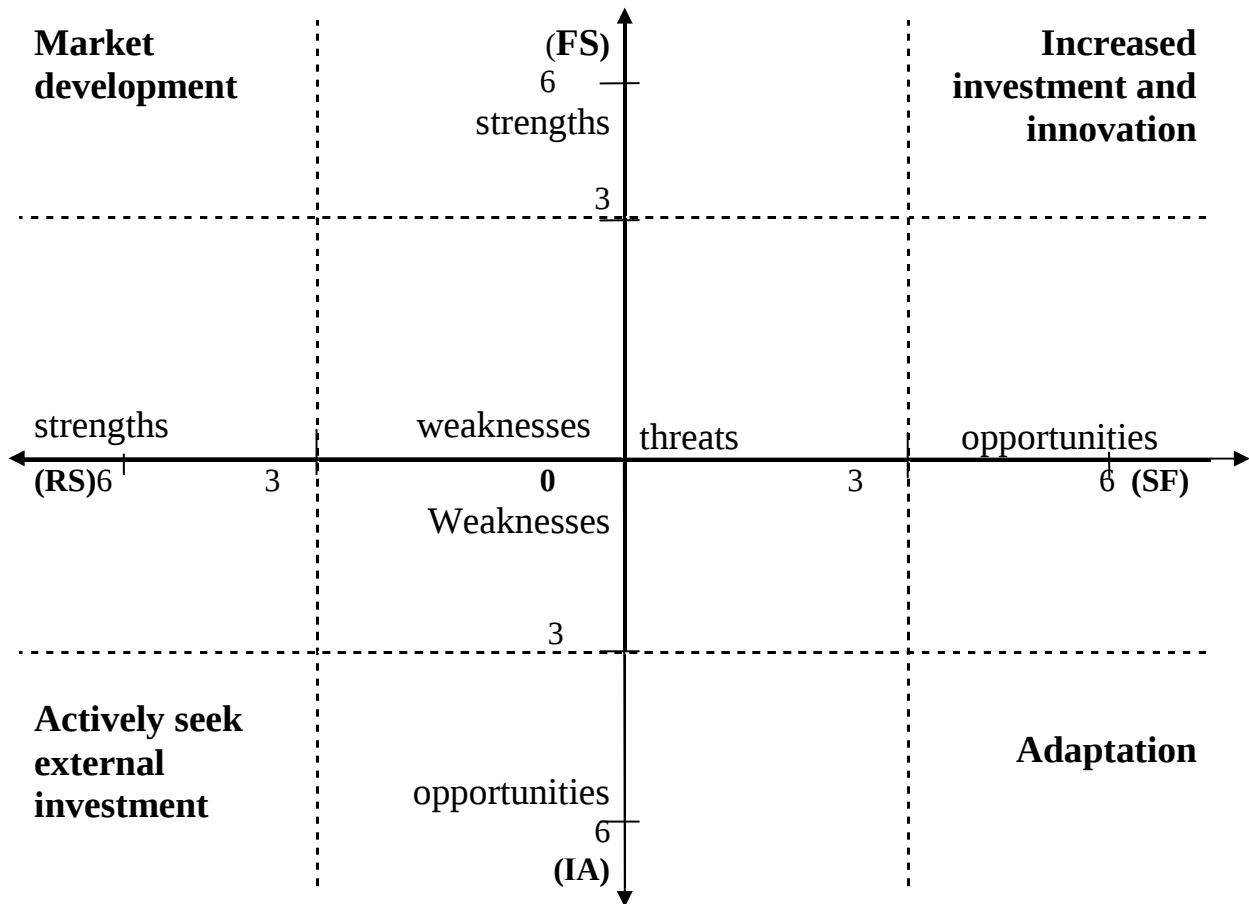


Figure. 2. Matrix study of investment and innovation alternatives (by author)

The combination of factor groups an opportunity to get a square - the field of strategic decisions. The size of the area - is the more business opportunities to achieve the investment objective.

Vector strategic position on the matrix determined $\bar{C} = (0; x; y)$. Coordinates vector, the method proposed in the formulas are:

$$x = SF - RS (1,6);$$

$$y = FS - IA (1,7)$$

The resulting vector of strategic development makes it possible to define a generalized strategy for innovation and investment. Vector length characterizes the present strategic opportunities enterprises, for certain groups because of the impact of factors that primarily take into account in the process of investment and innovation strategy.

Based on the study can offer the following business strategy in some sectors that can be expressed by the following equations periods:

1. $0 \leq \bar{C} \leq (3, -3)$ – an area of threats, which characterizes the combination of low innovation with low investment potential. Typical for industries that are under age. Vector enterprise aimed at this sector means that the company has low internal capacity for self-development in the not attractive from the investment point of view of the industry. Most appropriate in this case, is strategy to reduce investment and curtailment of production or continued operation based on traditional technologies within a niche.

2. $(3; -3) \leq \bar{C} \leq (6, -6)$ - zone opportunities, which combines high innovation and investment opportunities of development compared with underdeveloped domestic potential business. This situation is typical for the industries and markets in which there are strong leaders, the main competitive advantages of being innovative development. Because the industry is attractive, it is advisable to use an innovative strategy imitation or simulation within a particular niche.

3. $0 \leq \bar{C} \leq (3, 3)$ - an area which combines low investment opportunities in companies with low innovative capacity of industry. Characteristic of areas with low investment attractiveness. The basic strategy - survival extensive reproduction of fixed assets, minimize risks.

4. $(3, 3) \leq \bar{C} \leq (6, 6)$ - an area most favorable for development on the basis of innovation. Typical for business leaders for innovation-supportive market. Key strategies - active investments in innovation potential, the formation of innovative competitive advantages, access to international technology market, the formation of internal innovative venture, increased collaboration with research institutions.

5. $0 \leq \bar{C} \leq (-3; 3)$ - an area which combines the weaknesses of the company in the field of innovation and investment. At the same time, the company has some opportunities for self-development compared to other industry. Strategy - a moderate increase of investment and innovation potential, increase competitive advantage, avoiding significant risks, focus on the accumulation of investments for further movement in the sector (-6, 6).

6. $(-3, 3) \leq \bar{C} \leq (-6; 6)$ - an area which combines the strengths of the company in the field of innovation and investment. Typical for business leaders who create the innovations and create market innovative products. The basic strategy - to invest in product development, technology and market.

7. $0 \leq \bar{C} \leq (-3; -3)$ - Zone, which combines a number of investment attractiveness of the industry with low innovative capabilities of the enterprise. Basic strategy: the search for new markets or industries, small business in the niche market development using traditional technologies.

8. $(-3; -3) \leq \bar{C} \leq (-6; -6)$ - area of high innovation and high-potential investment area. Focusing on the development and implementation of new technologies by orders of large enterprises, public institutions, seek funding innovation.

The above strategy is a kind of generalization of the strategic position of the company in certain areas of the matrix, which make it possible to focus on improving the internal factors of the organization to adapt to external conditions. The following matrix contains 16 sectors, each of which makes it possible to determine the strength of the effect of individual factors in shaping strategy, the feasibility of investment and innovation specific industry or market, search for factors of competitive advantage.

In order to identify the main trends of changes occurring in the internal and external environment, as well as research strategy vector changes T_{k_i} under the influence of certain trends are prompted factor trends factor that takes into account the changing trends of certain partial indicators. Thus, equation (1.2), adjusted with regard to the above indicator:

$$K_i = B_i \cdot w_i \cdot T_{k_i} \quad (1.8)$$

where T_{k_i} - coefficient of trends in the K-th index.

As the determination of the changes T_{k_i} proposed definition of the average dynamics of growth parameters estimated for 3-4 years. According to the formula:

$$\bar{T} = 100 \cdot \sqrt[n]{\frac{Kcv}{Kb}} - 100 \quad (1.9)$$

where Kcv - the current value of the index;

Kb-values of the beginning of the test period;

n-number of the analyzed periods.

Adjustments to the dynamics of performance offered by the method given in Table. 2.

Table 2

Determination of indicator trends *

$\bar{T}$, %	$\bar{T} \geq 50$	$10 \leq \bar{T} \leq 50$	$-10 \leq \bar{T} \leq +10$	$-10 \leq \bar{T} \leq -50$	$-50 \leq \bar{T}$
T_{k_i}	1,2	1,1	0	0,9	0,8

* authoring

Adjustment parameters provides opportunities for dynamic positioning on the matrix during any period studied and, in the case of a positive vector dynamics can be used as a presentation in attracting additional investment resources development.

Conclusions and further research. The proposed method makes it possible to integrate all the factors analyzed in the course of the strategy on a single plane, and identify strengths and weaknesses on the market that can be used to create competitive advantage and accelerate the realization of strategic goals. For your convenience, the methods proposed to establish a model based on specific software. In this model should be considered especially enterprise, project or business process which performs object decisions. It makes recommendations for further research on the study of performance indicators and criteria for investment and innovation capacities at all levels of government.

References

1. Order of the Ministry of Economy and European Integration of Ukraine (25.03.2004) № 115 "On Approval of the Methodology evaluation of central and local governments to attract investment, the implementation of measures to improve the investment climate in their respective industries and regions, rating investment attractiveness of industries, regions and business entities and the corresponding report form [electronic resource].- Access: <http://www.kmu.gov.ua/control/uk/>.
2. Bachevskiy B. E. (2009). Potential and development enterprise: Teach. manual / B. E. Bachevsk, IV Zablodska, O. Reshetniak. Kyiv, *Center of Literature*,. 400.
3. Ilyashenko S.M. (2010) Innovation Management: A Handbook. Sumy. *University Book*. 334
4. Nemtsov V.D., Dougan L.E. (2001) Strategic Management. Kyiv. LLC "UVPK" EKSOb ", 560.
5. Pozniakova Oksana (2012). Investment and innovation strategy dairy processing / Dissertation for the degree of candidate . ek.s. Donetsk
6. Rating of investment attractiveness of regions (2013). Kyiv. *Produced by the Kiev International Institute of Sociology in partnership with the Institute for Economic Research and Policy Consulting on request of the State Agency for Investment and National Projects of Ukraine*, 333.
7. Rodionova I.V. (2011) Evaluation of scientific approaches in determining the innovative potential of enterprises . *Industrial Economics*. № 56 (4), 12 - 16.
8. J. Harynhton. (1990). Quality management in U.S. corporations. *Moscow: Economy*, 272
9. Khaustova K.M. (2013) Evaluation of innovative potential timber industry Transcarpathia. *Uzhgorod. Scientific Bulletin UzhNU. Economy Series*, 2 (39), 306-312
10. Khaustova K.M. (2009). The theoretical basis of assessment of investment and innovation capacity of enterprises in the context of a strategic approach. *Lviv, Scientific Bulletin NLTU (19.4)*, 299-304.
11. Shershnova S. E. Strategic Management(2004). Kyiv, Kyiv National Economic University, 699
12. H. Rowe, R. Mason, and K. Dickel (1982). Strategic Management and Business Policy: A Methodological Approach. *Reading, Massachusetts: Addison Wesley Publishing Co. Inc.*, 155.

Khaustova K.M. METHODS OF MODELING INVESTMENT AND INNOVATION STRATEGY OF ENTERPRISE

Purpose. The purpose of this paper is to develop theoretical and methodological guidelines to justify strategic alternatives of investment and innovation enterprises.

Methodology of research. Method SPACE (Strategic evaluation rating action) - is a complex method designed to analyze the position and selection of the optimal strategy. It provides an opportunity to analyze the existing strategy of the subject, even when it exists in implicit form. Four groups of criteria (characteristics) of estimation, such as: financial strength (economic potential), competitiveness, attractiveness and stability are allocated in the method SPACE. In the model united strategic approach to market positioning based on a SPACE-analysis method of rating assessment of integrated enterprises' investment and innovation potential in accordance with the conditions and trends in its operations.

Findings. The proposed method which provides an opportunity to integrate all the factors which are analyzed in the process of the strategy on a single plane, and determine the strengths and weaknesses points on the market that can be used to form the competitive advantage and accelerating the process of realization of strategic goals. An important advantage of the proposed model is its flexibility in use for different activities and enterprises of different size, type of customer and market orientation. To ensure comparability proposed to use ratios that characterize the level of entities innovation and investment resources and their effective use at two levels, such as: at the level of individual companies and the industry at large.

Originality. The scientific novelty of the study is to model of investment and innovation strategy by positioning the enterprise in the field of its activity against major competitors.

Practical value. The practical significance of the paper is to provide opportunities to use by enterprises, regardless of the type and scope of activity to justify the investment and development of innovative alternatives taking into account the characteristics of the industry or activity.

Key words: SPACE-analysis, strategic positioning, investment potential, innovative capacity, integrated assessment, rating, investment and innovation strategy.