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Use of Balanced Scorecard for Enterprise Competitiveness Assessment

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Abstract:

The problem of defining the prospects, opportunities, limitations and methodological format of assessing the competitiveness of an enterprise in a transitive economy using the Balanced Scorecard (BSC) concept has been considered. The relevance of the issue is due, on the one hand, to global trends in innovative development, and on the other hand, to the incompliance of performance of the post-socialist industrial enterprises with the characteristics of innovative development. The creation of mechanisms for improving the enterprise's competitiveness and its appropriate assessment based on the use of advanced management practices and technologies is becoming increasingly relevant.

The purpose of study is to improve methodological approach to the BSC-based assessment of competitiveness of a value-oriented enterprise, and to substantiate the prospects of effective integration of the BSC into the existing enterprise management system. This research paper justifies the possibility of using various methodological forms, including the simplest ones, of the Balanced Scorecard, which features a transformational nature, in the process of forming a balanced strategic

management of enterprise. Methodical approach has been proposed for identification of the enterprise strategy directed at increase of its market value and strategic competitiveness. Matrix analysis was applied to assess the enterprise performance indicators; it revealed a relationship between the enterprise's competitive position and class of its innovation BSC-based strategies. To assess the enterprise's competitiveness, an integral index of its investment attractiveness has been proposed, and to assess the class of the enterprise innovative strategies, an integral index of the enterprise innovations was calculated. The proposed methodological approach was used to perform expert sampling within the frame of indicators for determining the investment attractiveness and innovativeness of a metallurgical enterprise by the criteria of strategic orientation, efficiency and functionality. The study has analyzed the experience gained by the leading enterprises of Ukraine's metallurgical complex in using BSC in a limited methodological format as a tool for identifying the strategy of an enterprise, assessing its competitiveness, innovativeness and investment attractiveness. The result of the study was the conclusion about the possibility of applying the simplest Balanced Scorecard forms as a catalyst for innovative transformations and developing balanced enterprise management in transition economies.

Keywords: enterprise's competitiveness; investment attractiveness; innovativeness; strategic management; balanced scorecard.

JEL Classification: C13; M10; O30.

Introduction

An increased competition for investment resources is a characteristic feature of the innovative economic development. At the same time, the industrial enterprises of the Ukrainian transitive economy do not fit in the pattern of innovative development: their own funds remain the main source of financing innovations; there is acute shortage of credit resources needed to finance the modernization of production; there is no systematic governmental support for innovative development of the basic sectors. That is what necessitates steps towards establishing an effective mechanism for managing the strategic development of enterprises in the direction of prioritizing innovative strategies and changing emphasis towards innovations in production, technologies and management, increasing strategic potential and orientating the overall strategy to increasing the competitiveness of the enterprise in order to attract investment resources and achieve a technological breakthrough.

Therefore, the 'bottlenecks' of strategic management of the enterprise's competitiveness are in the field of innovation and investment strategies. The basis of handling the challenge is the transformation of strategic enterprise management into balanced management based on the Balanced Scorecard concept.

The purpose of the study is to improve the methodological approach to the BSC-based assessment of the competitiveness of a value-oriented enterprise and to substantiate the prospects of effective integration of the BSC into the existing enterprise management system as a move towards increasing the enterprise's competitiveness.

1. Research Background

Today's economic literature does not provide a universal interpretation of the essence of enterprise competitiveness. The reason is the extraordinary relevance and complexity of this problem in the modern globalized world, and consequently, the need for constant development and improvement of theoretical and methodological base for the essence and assessment of competitiveness at the national, international and enterprise level. The results of the study allow the statement that the category 'enterprise competitiveness' is characterized by a number of attributes, among which consistency should be in focus. Consistency involves taking into account the sum or the maximum number of parameters and conditions that shape the competitiveness of the enterprise, as well as their relationships and interactions.

In the economic literature, innovation and investment are in focus among the key factors for increasing competitiveness (Schumpeter 1939; McCraw 2006; Sipa *et al.* 2015). This gives grounds to define the investment attractiveness of the enterprise and its ability to effectively invest in innovation as a basis for an assessment of the competitiveness of a value-oriented enterprise. A similar idea was expressed by the authors (Meiliene *et al.* 2015) regarding the assessment of competitiveness at the level of national economy.

In the economic literature, the investment attractiveness of an enterprise is mainly considered as a function of its financial condition (Blank 2001; Dovbnia and Okhlopko 2007; Fedulova 2013). That is, without good reason, no attention is paid to such factor as the enterprise innovativeness. By innovativeness we understand its ability to effectively use and increase its innovation potential, to secure sustainable economic growth and competitive positions in the market in the process of innovation-investment activity. Therefore, under the conditions of globalization of capital markets, aggravation of competition for investment capital, and an increase in the enterprise value as the main criterion for the choice of investors, the competitiveness of an enterprise should be considered a multilevel integral concept. It combines a set of economic, financial, production and managerial aspects of the

enterprise assessment, and these have to meet the requirements of potential investors and provide a positive effect from innovation and investment activity.

A typical feature of the vast majority of existing methods of assessing the enterprise competitiveness is a retrospective bias toward the use of financial and economic indicators, that is, metrics of the material factors of enterprise value creation. The authors, in Voronon *et al.* (2017) propose a dynamic method of assessing the competitiveness of Russian metallurgical companies, which involves assessing their financial stability. However, the evolution of strategic enterprise management puts forward new requirements to the methodology for assessing the enterprise competitiveness. At the turn of the XXI century, the concept of the enterprise strategic development changed dramatically. Under the conditions of innovative development of economy, marketing orientation of the enterprise strategic development has changed toward the growth of its intellectual capital as the main factor of competitiveness. Globalization of financial markets, active search for innovative development resources are forcing enterprises to increase their investment attractiveness, to show potential investors the prospects of increasing market value that can significantly exceed the book value at the expense of intangible assets, such as advanced technologies, brand, business reputation, effective managerial decisions, etc. Researchers as Danko *et al.* (2018) rightly emphasize the need to manage the intangible assets' potential in leading companies in basic sectors of the economy. Thus, the focus of the enterprise strategic management shifts toward the management of intangible assets, which requires balancing of tangible assets as the 'determinants' of modern enterprise value and intangible assets as factors that determine the potential for increasing the market value and strategic competitiveness of the enterprise. From the perspective of strategy reach, 'factors-creators' are more significant because they are factors of development of enterprise potential (Friedag and Schmidt 2006). It is about effective managerial decisions, high quality of the managerial capital of the enterprise, ability not only to create and implement effective strategies, but also to actively manage the strategies on the basis of balancing all aspects of activity of the enterprise as an open system. Thus, the enterprise strategic management moves to a qualitatively new level of development - to the level of balanced strategic management (Faizova *et al.* 2018).

A characteristic feature of balanced enterprise management is the orientation of strategic development on the growth of the value and competitiveness of the enterprise from the positions of both financial and non-financial investors of intellectual capital: personnel, consumers, the government, etc. The focus also moves to managing the strategic aspects of enterprise competitiveness. This aroused an increased interest in the contemporary economic literature in the category of 'strategic competitiveness' (Mihnenko and Podkopaev 2014; Ovchinnikova *et al.* 2016), which synthesizes the concepts of 'competitiveness' and 'strategy', 'strategic management'. We do not consider 'strategic competitiveness' as a separate concept distinct from the basic concept of 'competitiveness'. However, the focus on a strategic resource in assessing the competitiveness of an enterprise also requires an appropriate adjustment of the methodological format of the assessment.

2. Methodological Approaches

The authors of the article proceed from the interconnection, interdependence and interaction between the enterprise strategy and its competitiveness: the type of enterprise strategy in terms of the requirements of innovative development, its effective implementation in the process of strategic management is a factor for increasing the strategic competitiveness of the enterprise; on the other hand, the competitiveness of the enterprise, whose key characteristics are, in our view, investment attractiveness and innovation, determines the choice of enterprise strategy and the need for its adjustment. Therefore, the proposed methodological approach to the assessment of the enterprise's competitiveness implies the following sequence of actions: first, the identification of corporate strategy based on the assessment of the enterprise's competitiveness, investment attractiveness and innovativeness; next, adjusting the enterprise's strategy in order to increase the effectiveness of its strategic management as a key factor in the growth of strategic competitiveness. The proposed methodology for assessing the competitiveness of an enterprise is built on the criteria of strategic orientation and effectiveness, when the main focus is on the strategic resource of each indicator and its ability to assess the degree of achievement of the strategy goal and ability to measure the most effective factors for its achievement.

A distinctive feature of the proposed methodology for assessing the competitiveness of the enterprise is the use of the Balanced Scorecard technology.

The issues of integration of the balanced scorecard into the practice of enterprise management have been addressed in the works of foreign and domestic researchers, namely: Gershun and Gorsky (2006); Ivakina (2007); Kaplan (2008); Kizim (2007); Pylypenko (2007); and others. At the same time, the analysis of competitiveness, investment attractiveness and innovativeness of the enterprise, on the one hand, and the mechanisms of integration of the Balanced Scorecard into the practice of industrial enterprise management, on the other hand, are developing

in parallel, rather autonomous modes. The existing scientific research mainly deals with the partial problems of the evolution of strategic management based on the Balanced Scorecard, considering the latter in a limited methodological format. Not enough attention is paid to the issues of the BSC transformation in accordance with the stages of evolution of strategic enterprise management. The methodological aspects of using the BSC in a limited format as a tool for identifying an enterprise's strategy and assessing its competitiveness, innovativeness and investment attractiveness remain imperfect and not fully elaborated.

The founders of the system, Norton and Kaplan (2008), define the BSC as a tool to transform the mission and strategy of an organization into a comprehensive set of performance metrics that serve as the basis for a system of strategic management and control (Kaplan 2008). In the BSC concept, financial and non-financial indicators of enterprise value are integrated taking into account the cause and effect relationships between performance metrics and key success factors that affect their formation. The balance in the BSC concept is multifaceted, covering the links between monetary and non-monetary indicators, strategic and operational levels of management, past and future results, and between internal and external aspects of the enterprise activity (Gershun and Gorskiy 2006).

However, to date, there is no unambiguous interpretation of the BSC essence in the economic literature. A historical or evolutionary approach allows the BSC definitions to be systematized into two main groups; this corresponds to the evolution of conceptual approaches to strategic management: the BSC as an accounting system and the BSC as an enterprise management system.

The revealed transformational nature of the Balanced Scorecard category gave rise for its parallel and simultaneous interpretation in the economic literature as a new system of strategic enterprise management (Ivakina 2007, 42, 150), as a tool for strategy evaluation and implementation (Ivakina 2007, 31), as a long-term management tool (Ivakina 2007, 45), as a component of management accounting and control system (Ivakina 2007, 32); at the same time, the researchers argue that the Balanced Scorecard is not a reporting system but includes the latter as an integral part (Ivakina 2007, 103). Such conceptual ambiguity is accompanied by a reference to Kaplan and Norton, who regard the balanced scorecard as an assessment system, strategic management system, and information spread tool (Ivakina 2007, 35). However, the classics of the Balanced Scorecard concept meant the objectivity of the process of the system evolution from an assessment to management system under the influence of innovative economic development and creation of appropriate environment for adaptation of the Balanced Scorecard to the existing system of enterprise management.

To sum up, from the standpoint of a systematic approach, we consider it necessary to clearly distinguish alternative aspects of the Balanced Scorecard category, given the existing differences in the methodological components of any economic system. Introducing the BSC as a management method is consistent with the concepts of intuitive, corporate and iterative strategic enterprise management. But even under these conditions of 'immaturity' of balanced enterprise management, it actually comes to the BSC methodology as a relatively autonomous system of interdependent, interrelated and complementary methods and tools for strategy implementation.

The use of the BSC as a tool, method or methodology for enterprise management provides: implementation of certain functions of strategic enterprise management (for example, information support of the strategy (Kyzym *et al.* 2007) or the use of management, evaluation, accounting, and information technologies; functioning of certain mechanisms of enterprise management, etc.

Technology is a way, an algorithm of combining the resources of an enterprise to achieve the goal, convert the input elements into output elements of the system. The BSC as a management technology is considered by researchers as a cyclical iterative process and sequence of implementations of management activities, including such stages as corporate planning, organizing, motivating, controlling and regulating; it covers all areas of the enterprise's activity (financial, logistical, social, information activities, etc.), the resource support and required control of compliance with the set goals.

Gershun and Gorsky (2006) in the paper 'Balanced Management Technologies' define the BSC as the mechanism of transformation of the company's strategy into a sequence of actions aimed at achievement of certain goals at all levels of management. The management mechanism is considered by the researchers as a system of basic forms, methods, levers of application of economic laws, solving the contradictions of social production, as well as formation of needs that interact on the basis of certain rules, procedures, and technologies. The mechanism can also be defined as a sequence of actions aimed at achieving a specific goal (Kulman 1993, 12), that is, a 'clutch', which determines the possibility of sustainable functioning of the entire enterprise management system. A considerable number of other interpretations of the mechanism are available in the economic literature. But those mentioned above focus on the main points in the problem of identifying the mechanism, such as the need to identify

the elements, methods and levers of influence on economic processes; the need to form certain provisions and the requirement of a dynamic approach to strategic enterprise management. According to a considerable number of researchers, the Balanced Scorecard allows taking into account all the above aspects (Pylypenko and Yaroshenko 2007).

The semantic (topologically meaningful) approach allows tracing the transformability of the Balanced Scorecard as a tool, method, methodology, mechanism, technology, system and model of enterprise management. That is, unlike the existing definitions of the category, we consider the BSC as a coherent management system with a conceptual and methodological basis, within which the appropriate mechanism (the BSC mechanism) drives the enterprise balanced management using strategy implementation methodology (the BSC methodology) based on the BSC technology.

Understanding the essence of the BSC as a management system is consistent with the concept of balanced enterprise management, within which a free interpretation of the Balanced Scorecard as a tool, technique, mechanism or technology is incorrect. However, the real process of transformation of strategic enterprise management is fully consistent with the practical use of the BSC in a limited methodological format, as a methodology or technology, etc., according to the specific conditions of maturity of the adaptive environment of the Balanced Scorecard effective integration into the enterprise management system. While the concept of chaotic management is entirely consistent with the use of BSC only as a management tool, the BSC as a methodology, technology or mechanism of strategy implementation is a sign of more mature stages of the evolution of strategic enterprise management. In our opinion, the BSC as an enterprise management system should be regarded as a synonym to balanced enterprise management. That is, within the framework of a balanced approach, considering the Balanced Scorecard as a system, it should be borne in mind that any complex and dynamic system can be designed in accordance with the set goals, functions and operating environment (Ananin and Bondar 2010).

In the process of forming a balanced enterprise management, changes are made to the methodological foundations of the BSC in the direction of overcoming rigid determination of the strategy (a strategy and the BSC are being developed in an iterative mode). The classic postulate of prioritizing the strategy development (Kaplan 2008) is absolutely correct when it comes to the BSC only as a tool or technology for the enterprise management. However, if the BSC is considered a coherent enterprise strategic management system, then rigid determination of strategy loses meaning: changes in the overall business environment force the company to constantly adjust the strategy, create a new business model, find new ways to create the enterprise market value and increase its competitiveness.

Identifying the strategy as the initial stage of integrating the BSC into a value-oriented enterprise management system allows using the Balanced Scorecard as a tool for assessing competitiveness. A new methodological approach to the identification of the strategy of a value-oriented enterprise has been developed. It takes into account the competitive position of the enterprise in the stock market and the class of innovation strategies, which are assessed on the basis of the BSC. The competitive position of the enterprise is characterized by an integral index of its investment attractiveness, and to determine the class of innovation strategies of the enterprise, an integral index of the enterprise innovation activity is calculated. Based on a matrix analysis of the enterprise performance metrics, a relationship is established between the competitive position of the enterprise and the class of its innovation strategies determined on the basis of the BSC.

According to the competitive position of a metallurgical plant, the strategy identification matrix (see Figure 1) is divided into two areas: weak (zero or negative index) and strong (positive index) competitive positions. If the innovation index of the enterprise is equal to or less than zero, the class of its innovation strategies is defined as defensive, otherwise it is defined as the class of offensive innovation strategies (Skovorodko 2006), based on technological and product innovations and business development according to the world management standards.

A combined approach was selected as the basis for an assessment of the enterprise investment attractiveness; it includes elements of expert and statistical methods for using financial ratios, calculation of the integral rating indicator; all these are presented in economic and regulatory sources and used in the practice of enterprise management.

The domestic practice of assessing the investment attractiveness of the enterprise widely uses the procedure regulated by the Order No. 22 of the Agency for Prevention of Bankruptcy of Enterprises and Organizations of February 23, 1998 (State Privatization Bulletin 1998). It is based on an assessment of the financial condition of the investee. However, both financial and non-financial investors seek to have comprehensive information about the factors that influence the formation of investment attractiveness of an enterprise. Another drawback of the existing legal framework for assessing investment attractiveness is the retrospective nature of the methodology, while the strategic investor is interested in the results of future activities. In addition, the set of

financial indicators, as specified in the regulatory document (State Privatization Bulletin 1998), is focused on the bankruptcy procedures, so the indicators are rather difficult to use directly to assess investment attractiveness.

Figure 1. Matrix for identification of the metallurgical enterprise strategy



Source: Compiled by authors.

Investment attractiveness of the enterprise should be formed not only at the level of the enterprise, but also at the level of the country, region, and branch. At the state level, this involves the creation of a regulatory framework for assessing the investment attractiveness of domestic enterprises, which would be adequate to the requirements of innovation and investment development of the modern economy. The concept of BSC may be a perspective direction of improvement of the legal base for the investment activity of an enterprise.

Already at the level of construction of an auxiliary BSC in a limited methodological format as a tool for strategy identification, the methodology for the formation of a primary set of local metrics and their corresponding correlation with financial and non-financial projections should imply the principle of balance of 'factors-determinants' and 'factors-creators' of the enterprise's market value (Friedag and Schmidt 2006, 35) (and related indicators) by criteria of strategic focus, as well as effectiveness and functionality. According to this approach and the assessment of factors of the metallurgical enterprise value creation (Khaustova and Kurochkina 2009), the rating score of investment attractiveness should take into account: assessment of financial performance, financial stability and liquidity; results of the analysis of business activity and profitability; scale of business; quality of management and market indicators.

3. Case Studies

The pipe enterprises of the Prydniprovsky Region in Ukraine were chosen as the site for the development and testing of the project of the BSC integration into the system of strategic management at a metallurgical enterprise. Table 1 presents the results of the BSC-based calculation of the integral index of investment attractiveness of DMZ Kominmet LLC as a value-oriented enterprise over the period of 2017 – 2018 (Manufacturer's official website 2020).

For metallurgical enterprises in the process of the BSC integration into the strategic enterprise management system, the choice and formation of the primary set of local metrics of investment attractiveness are objectively limited by the official financial statements. The reasons for this are the purpose of the analysis, current level of strategic management at the enterprise and lack of adequate information support for the 'non-financial' component of the BSC.

Taking into account the purpose of using the BSC as a strategy identification tool, the 'publicity' of the enterprise, which demonstrates the 'transparency' of the market value creating potential, was chosen as an integral non-financial indicator of the quality of management in a strategically oriented organization. The publicity percentage was calculated based on the assessment of the possibility / inability to obtain the needed open source information for each of the indicators by the formula:

$$Pn = \frac{\sum_{i=1}^k x_i}{2k} 100\% \tag{1}$$

Where: k is the number of indicators selected; x_i is expert evaluation of the possibility of obtaining open source information concerning an i -th indicator.

In the 'staff/development' projection, the level of publicity assumes a maximum value of 100% in the case of financial and non-financial data availability on the official website of the enterprise. The resulting percentage is further divided by '2' if access to the information is hindered or the enterprise's 'openness' of information is purely

declarative. The market indicators that are to be included in the local performance chart are objectively limited by the return on the shares listed on the PFTS Stock Exchange as non-listed securities.

Table 1. BSC-based calculation of the integral index of the metallurgical enterprise investment attractiveness *

Indicator	Relative significance of an indicator, λ_i	Degree of compliance of the actual value of an indicator to its normative* value, Y_i	Score of the i -th indicator, given its significance, $Y_i \times \lambda_i$
Finance / Investors			
Sales growth rate	0.056	0.1617	0.0091
EBITDA margin	0.059	-0.2729	-0.0161
Net profit / uncovered loss	0.059	-2.6198	-0.1546
Autonomy Ratio (Financial Independence Ratio)	0.059	-1.1120	-0.0656
Coverage ratio	0.056	-0.4650	-0.0260
Return on assets, %	0.059	-1.1431	-0.0674
Return on equity, %	0.059	-0.6170	-0.0364
Dividend yield	0.052	-0.3859	-0.0201
Customers			
Share of steel pipes in national production, %	0.053	-0.0686	-0.0036
Exports growth rate, %	0.056	-0.0870	-0.0049
Internal processes			
Fixed capital depreciation ratio	0.053	0.7568	0.0401
Product profitability, %	0.059	0.0390	0.0023
Profitability of production, %	0.053	-0.0067	-0.0004
Cost of 1 UAH products sold, kop. / UAH	0.053	0.0029	0.0002
Inventory turnover ratio, times	0.054	0.2072	0.0112
Staff / Development			
Labor productivity, UAH / person	0.054	0.0463	0.0025
Average monthly wage per 1 employee, UAH	0.053	0.0325	0.0017
Level of publicity, %	0.053	-0.5900	-0.0313
Overall score	1	-	-0.3593

Note: *Data from a competitor enterprise

The significance of the selected indicators is rated on a 20-point scale (based on expert selection of indicators with the highest overall score); the relative significance of each of the selected indicators (no more than 20) is assessed, given the share of an indicator score in the total points (Korn, Korn 1968):

$$\lambda_i = \frac{O_i}{\sum_{i=1}^k O_i} \quad (2)$$

Where: O_i is score assigned to the i -th indicator in its significance assessment; λ_i is relative significance of the i -th indicator; k is number of indicators selected.

In order to assess the experts' answers, we confirm the difference existing between the selected indicators using the adjusted Friedman test. According to the test, the answers of all experts are considered as samples. Given that different indicators can be estimated with the same number of points, Friedman's criterion is determined by the formula (Korn and Korn 1968):

$$F_{\phi}^{ck} = \frac{\sum_{j=1}^n \left[\sum_{i=1}^k R_{ij} \times \frac{1}{2} \times k(n+1) \right]^2}{\frac{1}{12} \times k \times n(n+1) - \frac{1}{n-1} \sum_{i=1}^k T_i} \quad (3)$$

Where: R_{ij} is rank assigned to the i -th indicator by the j -th expert; k is number of samples to be analyzed; n is number of indicators, whose significance is estimated by experts of the metallurgical enterprise.

T_i is a statistical parameter calculated by the expression (Korn and Korn 1968):

$$T_i = \frac{1}{2} \sum_{t=1}^m (n_t^3 - n_t), \quad (4)$$

Where: n_t is number of ranks that coincide within group t ; m is the number of groups of ranks that are recurring in the expert's answers.

The Friedman criterion defined by formula (3) is 523.64. In order to confirm the existence of difference between financial and economic indicators, it is necessary to compare the calculated Friedman criterion with the critical distribution value: χ^2_{crit} , which is 63.69 at the significance level of 0.01 and 43 degrees of freedom (Korn and Korn 1968). Hence, with probability 0.99, it is possible to state the difference between the indicators, whose level of significance is being estimated by experts, since the inequality holds: $F_{\phi}^{ck} > \chi^2_{crit}$; (523.64 > 63.69).

The next important step in evaluating the answers of the metallurgical enterprise's experts is to study the level of concordance of their opinions, which is determined by the Kendall's coefficient of concordance (W) (Korn and Korn 1968):

$$W = \frac{F_{\phi}^{ck}}{k(n-1)} \quad (5)$$

Kendall's coefficient of concordance calculated according to the experts' answers in assessing the significance of the indicators is 0.75. Consequently, the consensus of experts is high.

Based on the proposed methodological approach, an expert sampling of performance indicators for assessing the investment attractiveness of DMZ Kominmet LLC was made according to the criteria of strategy orientation, efficiency and functionality. The BSC-based assessment of the investment attractiveness maximizes the use of each indicator's strategic resource. For instance, according to the financial and investment projection, the EBITDA margin indicator is intended to demonstrate to the investment community the prospects of increasing the market value of the enterprise through assessing the efficiency of its operating activities and reserves for self-financing. From the standpoint of the overall score of the effectiveness of the enterprise's financial and economic activities as well as the prospects and horizons of implementing innovation strategies that significantly affect the assessment of investment risks, the magnitude and dynamics of net profit/loss acquires certain features of a 'factor-creator' of the enterprise's future value. Sales growth rate measures the dynamics of business growth as the most important factor in the metallurgical enterprise value creation (Ruzhanskaya and Krutikov 2006). Historical ratios of financial soundness, liquidity and solvency, return on assets and equity indicate the financial condition of the enterprise and multiple risks for potential investors, financial institutions, consumers of the enterprise's products, and suppliers of raw materials. In the structure of retrospective financial ratios, the profitability ratio, whose value should be benchmarked with the competitors, acquires a specific status as the indicator of the future value, demonstrating to the investment community the competitive position of the enterprise in the pipe sub-sector. In the subsequent calculations of the integral index of investment attractiveness, either the normative values / data of the analogue enterprise or the calculated indicators of the given enterprise for the previous year are used as basic values. The score of each of the selected indicators is calculated by the formula:

$$Y_i = \left(\frac{K_i}{N_i} - 1 \right) \times x, \quad (6)$$

Where: Y_i is the score of the i -th indicator; K_i is the actual value of the i -th financial and economic indicator; N_i is the normative (recommended) value of the i -th indicator; x - takes the value 1 if the increase in the value of the indicator has a positive effect on the investment attractiveness of the enterprise, and -1 , with a negative impact. Since all the indicators selected as metrics of investment attractiveness are of different significance, and given that the actual values of these indicators exceeding the normative / recommended ones produce a positive effect on

the overall level of investment attractiveness, the weighted arithmetic mean was chosen as the formula of the statistical convolution to determine the value of the integral index.

The financial and economic condition of the enterprise is better, the closer the value of index I to 1:

$$I = \frac{\sum_{i=1}^n \lambda_i \times Y_i}{\sum_{i=1}^n \lambda_i} \quad (7)$$

Where: λ_i is coefficient of significance of the i -th indicator.

Since the denominator of the integral index is always 1, the formula 7 takes the following form:

$$I = \sum_{i=1}^n \lambda_i \times Y_i. \quad (8)$$

The BSC-based results of the investment attractiveness rating are further interpreted using the proposed rating scale (Table 2). It allows identifying the competitive position of the company by the following criteria: the investment community's perception of prospects for the growth of the enterprise value; the degree of maturity and quality of the enterprise strategic management; the level of financial and economic efficiency, and the probability of bankruptcy, i.e. the degree of risk for potential investors. The analysis by the results of the convolution and the evaluation of the integral index according to the proposed rating system revealed insufficient investment attractiveness of DMZ Kominmet LLC, which allows rating the competitive position of the enterprise as weak.

The next step in strategy identification by the proposed methodological approach is to establish a class of innovation strategies, which is assessed depending on the integral index of the enterprise's innovation activity; the latter is evaluated similarly to the index of investment attractiveness, formulas (2) – (8), by filling in Table 3.

To assess the innovation activity of the enterprise, the following indicators were selected (Zaglumina 2011; Moroz 2012): sales volume, market share, profit per 1 UAH of capital investment, and the quantity of innovative implementations. As the index of investment attractiveness and the index of innovation activity take negative values, the strategy of DMZ Kominmet LLC is assessed as a stabilization strategy by its competitiveness score.

4. Research Results

The proposed methodological approach to the assessment of the enterprise competitiveness is universal and allows identifying the enterprise strategy. This, in turn, is fundamental to the choice of a further scenario for the BSC-based reformation of the strategic management system of an enterprise in order to increase its efficiency and, consequently, the enterprise's competitiveness.

Table 2. Rating score of a value-oriented enterprise by the level of investment attractiveness*

Score	Rating	Description
≥ 0.51	High	High prospects for an increase in the market value and yields on securities. Strategy-oriented company with high quality corporate management. Stable financial condition and high efficiency of the enterprise. Minimal investment risk.
0.01 – 0.50	Sufficient	The financial and economic condition of the enterprise is sustainable. Low probability of bankruptcy. The level of corporate management is perceived as credible by investors. There are significant reserves for improving financial and economic performance and for increasing market value. Moderate risks for potential investors.
0 – (-0.30)	Satisfactory	Reliability of the company is suspicious, insufficient level of solvency. There is some potential for market value growth. A qualitative transformation of the corporate management model is required. Significant risks.
-0.31 – (-0.60)	Insufficient	The financial condition of the enterprise is unstable. There is a high probability of bankruptcy. It is necessary to develop a comprehensive program of improvement of the enterprise's performance. High risks.
≤ -0.61	Unsatisfactory	Poor financial condition. The enterprise is in a state of bankruptcy or in a deep crisis. Major changes are needed: restructuring or redevelopment. Extreme risk of investing in the enterprise.

Source: Compiled by the authors.

Table 3. Calculation of integral index of innovation activity of 'DMZ Kominmet' LLC*

Indicator	Relative significance of the indicator, λ_i	Compliance of the actual value with normative* value of the indicator, Y_i	Score of the i -th indicator, given its significance, $Y_i \times \lambda_i$
Sales volume, thousand tons	0.32	-0.4089	-0.1309
Market share, %	0.27	-0.3663	-0.0989
Earnings per 1 UAH of investment capital	0.21	-2.1765	-0.4571
Implementation of innovative developments	0.2	-0.6667	-0.1333
Overall score	1	-	-0.8202

Note: * Data from a competitor enterprise.

Formation of a system of balanced management at a domestic metallurgical enterprise through transformation of the Balanced Scorecard from a tool of strategic management to a holistic system of the enterprise strategic management as a more complex economic system is an objective process, which proceeds from the general properties of any system (Sviderskij 1962). It is about the fact that the enterprise system seeks a stable equilibrium. This implies adapting its own parameters to the changing environment and factors of innovative development through appropriate instrumental components of a progressive management system. The persistent integration of the Balanced Scorecard into the strategic management system of a metallurgical enterprise and creating the necessary environment activates such properties of the system - the enterprise system - as heredity, copying and reproduction of new forms as well as multiplicity of progressive components and manifestations of functioning. The conscious and purposeful business development according to the world management standards results in the transformation of major enterprises of the domestic metallurgy, which are in the process of implementing the Balanced Scorecard methodology, into the driving force of innovative development of the entire industry based on the synergy of the economic system as such.

Among the metallurgical enterprises in the Prydniprovsky Region of Ukraine, Interpipe Niko Tube LLC was the first to test the Balanced Scorecard (the project started in 2007). Active implementation of the Balanced Scorecard-based strategic management has allowed Interpipe Niko Tube to take leading positions in the industry, carry out large-scale investment projects, and achieve high production culture and staff quality. At the same time, there is a haphazard and inconsistent action in the domestic practice as to developing business according to the standards of the world management, support and development of a culture of a strategically oriented organization. In most basic domestic enterprises, regardless of the scale of their activity and volume of business, the development strategy is poorly formalized or totally absent. This is also true of competitive strategies. Formalization of the business process system is also absent in most cases. The experience of applying the BSC in the domestic industry leaves open the question of its effective integration into the overall enterprise management system. The improvement of the classical BSC methodology and its adaptation to the existing conditions of functioning of domestic industrial enterprises is becoming increasingly relevant.

The practical significance of the results obtained is that the theoretical provisions and methodological approaches outlined in the article have been brought to the level of specific methodologies and recommendations aimed at the development and improvement of strategic management of metallurgical enterprises as a factor of enhancing their strategic competitiveness.

5. Discussions

Today's world lives in an era of radical changes, global crises, constant and dynamic innovations, and multivariate integration processes, the final goal of which is the transformation of socio-economic systems and their adaptation to the new changing environment. A characteristic feature of transitive processes in post-socialist economies is their integration into global and international regional economic systems. A relevant issue today is the creation of appropriate mechanisms for the use of advanced international management practices and technologies, and entities own competitive advantages.

The characteristic feature of the evolution of the industrial enterprise strategic management in Ukraine's transition economy is the focus on cost-oriented management. That is, the management panel of a value-oriented metallurgical enterprise should be aimed at:

- management of the investment community;
- evaluation and justified choice of business value growth strategy;
- ensuring the formation of enterprise value through balanced management.

This requires the use of advanced management technologies to assess the enterprise competitiveness, among which we consider the high potential of the BSC. The formation of balanced enterprise management is accompanied by a modification of the BSC methodological format according to the stages and local goals of business development in compliance with the world management standards. The starting point is the use of the BSC as a tool for assessing the competitiveness, investment attractiveness of the enterprise and its innovations, i.e. as a tool for identifying and further adjustments of the company's strategy.

Conclusions and Further Research

From the results of the study, the following conclusions were drawn:

- it has been established that the transformation of intangible assets, of the enterprise management capital into a long-term factor of its competitiveness is accompanied by the evolution from strategic to balanced management of the enterprise;
- the study of the transformational nature of the BSC has revealed that the mechanism of its integration into the enterprise management system involves the use of various, including the simplest methodological forms of the Balanced Scorecard as a tool for identification and justified choice of innovation development strategy, which in turn becomes a necessary stage of forming balanced strategic enterprise management;
- it has been found that the identification of the strategy as an initial step in integrating the BSC into a value-oriented enterprise management system allows using the Balanced Scorecard as a tool for assessing the enterprise's competitiveness, investment attractiveness and innovativeness. Matrix analysis of the metallurgical enterprise performance indicators identifies the relationship between the competitive position of the enterprise and the BSC-based class of its innovation strategies. At the same time, the methodological format of assessing the enterprise's competitiveness is being modified in the direction of expanding the list of evaluation indicators beyond the financial component of the enterprise strategy. This approach allows a more complete and comprehensive characterization of the state of the enterprise, taking into account the specific demand of different groups of investors, including non-financial ones, for the amount of information they need;
- the transformation of the regulatory framework for the innovation and investment activities of enterprises into a powerful impetus to economic growth necessitates the use of a well-founded methodological approach to assessing the investment attractiveness of economic entities. At the heart of this approach, we see the concept of the Balanced Scorecard.

Further studies address the prospects, opportunities, limitations and methodological format of integration of the BSC into the enterprise management system, based on the generalization of experience of the major metallurgical companies in Ukraine.

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