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FINANCIAL COMPONENT OF ESTIMATION OF EFFICIENCY OF MANAGEMENT OF ENTERPRISE ON BASIS OF BSC

Abstract. The current trends in the aircraft building market are highlighted and the transformation need of the management system from the industrial to the partner model of the aviation products manufacture are actualized. The prerequisites for the target approach usage to assessing the management effectiveness are substantiated. The research methodology based on the use of the balanced indicator system BSC and the author adapted model of the key indicators of the company's efficiency for assessing the management effectiveness of the aircraft building enterprise is proposed. Such indicator was defined the social responsibility of business — an integrated indicator of the value of the enterprise for the society in order to improve the quality of life. At forming of the system of evaluation indexes certainly main principles of their construction: simplicity and visibility of the indicator system; limited number of indicators; the ability to measure indicators; determining the impact of each indicator on the enterprise efficiency as a whole. In order to evaluate the financial component of achieving the long-term goals on the basis of the BSC model and within the financial policy of JSC «Motor Sich» the following indicators have been chosen: return on equity, turnover assets, value of capital, structure of equity capital, loan interest rate, market size, market companies share, sales profitability, net profit per one share, coefficient of gross change ratio, coefficient of production cost factor, coefficient of administrative expense ratio, coefficient of implementation costs and coefficient the ratio of net profit. Research results specify on the positive changing — increase on the enterprise of efficiency of management operating charges. The factors of their negative influence on the possibility of achieving the strategic goal of the enterprise have been determined on the basis of their calculation and quantitative data analysis: According to the criteria of the financial component of the activity of the aircraft building enterprise, trends of changes were determined and the depth of deterministic influence of the indicators of efficiency of JSC «Motor Sich».

Keywords: finances, management effectiveness, aircraft building enterprise, evaluation, target approach, balanced indicator system, strategy.

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ФІНАНСОВА СКЛАДОВА ОЦІНКИ ЕФЕКТИВНОСТІ МЕНЕДЖМЕНТУ ПІДПРИЄМСТВА ЗА ЦІЛЬОВИМ ПІДХОДОМ НА ОСНОВІ BSC

Анотація. Висвітлено сучасні тенденції на ринку авіабудування та актуалізовано необхідність трансформації системи менеджменту від індустріальної до партнерської моделі виробництва авіапродукції. Обґрунтовано передумови використання цільового підходу до оцінювання ефективності менеджменту. Запропоновано методику досліджень на основі використання системи збалансованих показників BSC та адаптовану нами модель ключових показників ефективності компанії для оцінювання ефективності менеджменту авіапідприємства. При формуванні системи показників оцінювання визначено головні принципи їх побудови: простота і наочність системи показників; певна кількість показників; можливість вимірювання показників; визначення значущості впливу кожного показника на ефективність діяльності підприємства в цілому. Для оцінювання фінансової складової досягнення довгострокових цілей підприємства на основі BSC-моделі у рамках фінансової політики ПАТ «Мотор Січ» обрано показники та індикатори: рентабельність власного капіталу, оборотність активів, вартість позикового капіталу, структура позикового капіталу, процентна ставка за кредитом, ємність ринку, частка підприємства на ринку, рентабельність продаж, чистий прибуток на одну просту акцію, коефіцієнт зміни валових продаж, коефіцієнт виробничої собівартості, коефіцієнт адміністративних витрат, коефіцієнт реалізаційних витрат, коефіцієнт чистого прибутку. Результати дослідження вказують на позитивні зміни — підвищення на підприємстві ефективності управління операційними витратами. На основі їх розрахунку та аналізу кількісних даних визначено фактори негативного впливу на можливість досягнення стратегічної мети підприємством: зниження рентабельності власного капіталу та рентабельності продаж; збільшення вартості залученого капіталу; зменшення витрат на інноваційну діяльність, низькі темпи впровадження передових високотехнологічних виробництв, операційна недосконалість. За критеріями фінансової складової визначено тенденції змін і встановлено глибину детермінантного впливу показників ефективності ПАТ «Мотор Січ».

Ключові слова: ефективність управління, фінанси, авіаційне підприємство, оцінювання, цільовий підхід, система збалансованих показників підприємства, стратегія.

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ФИНАНСОВАЯ СОСТАВЛЯЮЩАЯ ОЦЕНКИ ЭФФЕКТИВНОСТИ МЕНЕДЖМЕНТА ПРЕДПРИЯТИЯ НА ОСНОВЕ BSC

Аннотация. Отражены современные тенденции на рынке авиастроения и актуализирована необходимость трансформации системы менеджмента от индустриальной к партнерской модели производства авиапродукции. Обоснованно предпосылки использования целевого подхода к оцениванию эффективности менеджмента. Предложена методика исследований на основе использования системы сбалансированных показателей BSC и адаптированную нами модель ключевых показателей эффективности компании для оценивания эффективности менеджмента авиапредприятия. За критериями финансовой составляющей определены тенденции изменений и установлена глубина детерминантного влияния показателей эффективности ПАО «Мотор Сич».

Ключевые слова: эффективность управления, финансы, авиационное предприятие, оценивание, целевой подход, система сбалансированных показателей.

Формул: 0; рис.: 3; табл.: 2; библиограф.: 16.

1. Introduction. Aviation industry is a branch of the economy of mechanical engineering, connected with the design, development and production of aircraft, as well as internal equipment of planes and helicopters. The enterprises of the branch are not only knowledge-intensive, innovative, but also highly integrated productions, market-integrated entities, which interact with numerous suppliers and market agents within the framework of industrial cooperation. Therefore, this is the complex production, the elements of which are the key processes for the creation of aviation technology — the standards used, normative documentation, technology, component database, cooperative schemes, toolkit, production and management organization. It is estimated that the additional volume of industrial production from the transfer of aircraft construction technologies to related areas is 2.8 times higher than its own growth of the industry [1].

Highly integrated production requires highly professional management, a systematic approach to production organization in aircraft construction using modern science and management practices. In this context the financial component management effectiveness evaluation is a necessary component of adaptation of management to new changing environment. For example, due to technological and managerial innovations, the national produced helicopter Mi-2 took the altitude of 7 kilometers, Mi-8MSB — 9155 meters, the world record for the Guinness Book of Records [2], and in the year 2020 analysts predict the emergence of hybrid airplanes [3].

One of the main reasons for the crisis situation of most Ukrainian enterprises is unsuccessful and ineffective management. In modern economic conditions, when the overwhelming majority of enterprises are trying to survive, the most effective way to improve their performance is to change the approaches to the organization management. The evaluation as a process gives management the opportunity to see inconsistencies, disadvantages of the main and support units, departments, processes of aviation production, and for financial analyst the assessment itself is a monitoring and diagnostics method, a tool for acceptance or correction of management decisions.

2. Analysis of researches and raising of task. Modern researches of estimation of efficiency of management airbuild enterprises are conducted in the aspect of quality management — Pavelko V.Yu. [4], Silenov M.A. [5], management airclusters — Morozov S.I. [6], estimations of mechanism of adaptive control system by a production — Makhit'ko V.P., Konev O.M. [7, s.

1484], estimations of efficiency of management of airlines [8, s. 53—56]. In this sense Magdanov P.V. considers that, the use of the system of quantitative and high-quality estimations of research object allows to find the optimum value of the state of object for the aims of making decision, planning et al [9, p. 7].

Directly, scientific labours in relation to the evaluation of efficiency of management of aircraft buildings enterprises it is not discovered by us, that is why there is an objective necessity of scientific research of this theme.

The purpose of the article is determination and calculation of financial component estimation of efficiency of management of enterprise after having a special purpose approach on basis BSC.

3. Research results. Preconditions for the target method of research complication directly of the applied management of aircraft buildings enterprises is, from one side, and from the second, integration of methods of organization and management the difficult systems.

A modern innovative management in aircraft building is determined: the complexity of the production and service complexes management — from holdings to the latest platform formations of the organization of network type business in aircraft construction; formation of innovative approaches to the organizational structure and new organizational design by separating the aircraft construction cycle into the centers of responsibility, the functioning of which involves a higher level of production specialization, integration with markets of outsourcing and other intermediaries; increasing the role of the competent component in the formation of project teams, media and cross-sectoral interactions, social responsibility of business.

There is the expansion of the functions of aviation corporations in the sphere of marketing, development, assembly and after-sales services, with an increasing tendency to transfer functions for the production of individual systems and components of integrated structures through outsourcing in the global aircraft industry. In the global market, not only products (airplanes, helicopters, etc.), but also effective management of the corporation, compete with their resources and competencies.

Therefore, there is a need to transform the very model of activities organization. Based on the analysis of previous studies, it can be argued there are technological and geographical preconditions for the creation of air-cluster formations in Zaporozhye, Kiev and Kharkiv [10, p. 98]. Creating a cluster as an organizational form of cooperation between aviation cluster enterprises allows solving three organizational and managerial tasks: to integrate cluster participants on the basis of an agreement on economic interaction; to attract additional investments into the air-cluster's enterprises and projects; to develop contractual relations with industrial enterprises of other branches of the country [6, p. 18].

In Ukraine the private-public model of the aircraft building organization with a transition to a new production organization based on cooperation, a partnership of suppliers of resources, materials, small-scale units, modules functioning in a competitive environment is more widespread.

In the new production organization, the organizational structure is formed by dividing the aircraft construction cycle by the centers of responsibility, namely: the center of production, the center of operation, the airport service center, the training center. According to the specific features of the aviation equipment production the above units are united on the integrity principle of the products life cycle — «engineering — production — sales — operation». The production and technological cycle itself is not new, but the approaches to the production organization, where the final integrator co-operates all the links in the final product, provides sales organization and after-sales service are innovative.

Significantly, that similar production management transformation was carried out by automobile concerns of Japan, South Korea, and it proved to be effective. For example, performance is achieved through specified orders and product parameter changes in relation to their unification. Unification of the product line of aircraft construction enterprises allows to achieve not only the unification of the main hubs, units, modules of the aircraft or the helicopter, but also the unification of the systems and equipment included in the list of necessary spare parts for renovation

works and maintenance, unification of tools, equipment and facilities at the airports, unification of flight and ground personnel training.

Consequently, management is based on numerous coordination methods that must be adopted in each organization in different proportions according to a particular situation, that is, effective management is system management. In view of the above, it can be argued that the essence of modern management is the rapid adoption of optimal solutions in the conditions of multicriteria choice.

Methodology of research and use of the balanced score card BSC for management effectiveness evaluation of the aircraft building enterprise based on modern approach of management after aims — Management by objectives (MBO) — an approach that can be defined as a process of setting goals and criteria for the effectiveness of employees, individual units and the whole organization and coordinating efforts (resources) to achieve them [11]. MBO is on the verge of systematic and procedural approaches to management and incorporates the features of both of them.

An important component of management by objectives is to compare the current efficiency of enterprises and/or employees with each other and with standards. The main advantage of this approach is the ability to establish a link between the motivation of employees and the efficiency of the company as a whole that it is presented on *Fig. 1*.

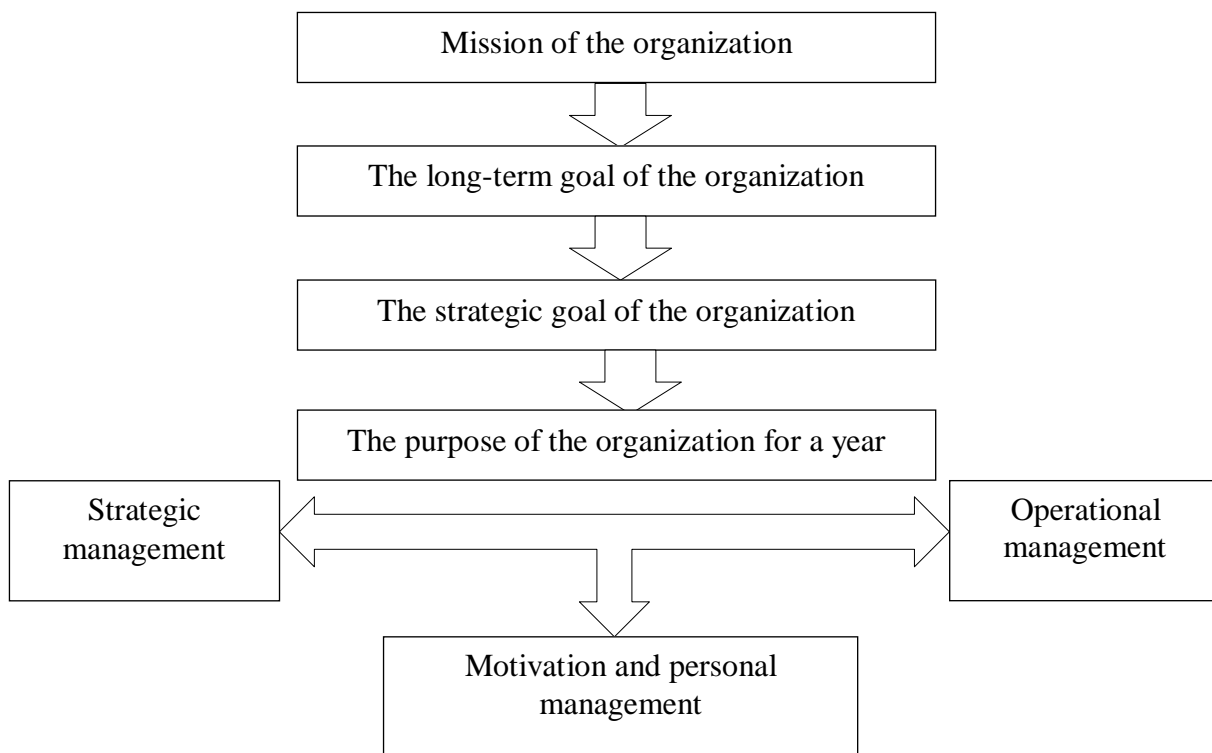


Fig. 1. System of management by objectives (*development of the author*)

Management by objectives is related to Performance Management (PM, employee performance evaluation (management) in terms of objectives set before them), Key Performance Indicators (KPI, Key Performance Indicators, or Quantitative Performance Indicators) and the Balanced Score Card (BSC, System balanced indicators) that it is presented on *Fig. 2*.

As already noted above, the main problem in the process of management effectiveness evaluation of the aircraft building enterprise is the choice of indicators, because: firstly, the classical financial indicators built on a retrospective analysis do not make it possible to make timely adjustments to the activity of enterprises; and secondly, these indicators allow us to assess only the financial side of the enterprise; thirdly, they do not take into account the specifics of the aircraft building enterprise.

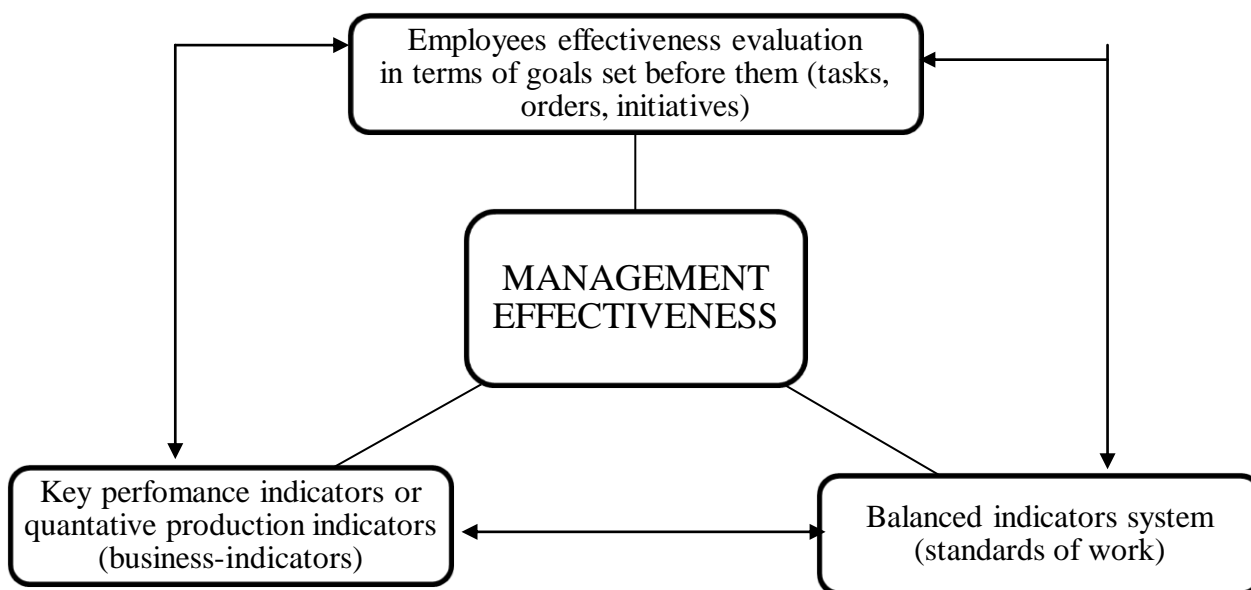


Fig. 2. Components of management by objectives (*author's development*)

As a result, the potential of the enterprise remains unused, namely, the orientation only on the financial indicators does not provide an increase in the management efficiency of the aircraft building enterprise, which in the present conditions can lead to loss of competitiveness. The management effectiveness of the machine-building enterprise is a diverse category and, to a large extent, depends on and is created by top managers, shareholders, personnel, clients and partners, intermediaries, consumers, the state, etc.

And consequently, the management effectiveness is formed by the integrated activities of all components of the company, representing a complex of organizational, marketing, financial, commercial, product decisions. Therefore, the evaluation of management effectiveness should be based on indicators that do not belong to the system of usual financial indicators, such as the level of education and personnel qualifications, the degree of consumer loyalty, the duration and continuity of partnerships, the image of (goodwill) enterprises, etc.

In view of the above, the Balanced Scorecard System (BSC D. Norton & R. Kaplan) was selected as the basis for the management effectiveness evaluation based on the target approach [12]. The model takes into account the indicators of intangible assets of the enterprise, and on the composition this is a set of related goals, indicators, objectives and measures that describe the strategy of the company and the way to achieve it. This system helps to transform such a complex and often uncertain object, as a strategy, into something concrete and accessible for understanding [13, p. 6—11]. The main feature of BSC, developed by American researchers D. Norton and R. Kaplan, is that it operates on the basis of four criteria: finances, consumers (clients), internal processes, personnel training and company growth — implementation of non-financial indicators to the company activities analysis [12, p. 47—54].

At the same time, the classical BSC scheme is aimed, first of all, at assessing the internal component of management effectiveness. Consequently, its modification is required in order to adapt to the current requirements of the industrial enterprise functioning. As one of the main goals of any enterprise is to improve the lives of people (societies, communities), then in our opinion, the fifth component (direction) of evaluation should be «Social Responsibility» as a measure of perception (positioning) of a company in a society and assessment own activities through the vision of members of society. This direction allows us to determine the value of the enterprise for the

general public and assess how the social responsibility of the enterprise is implemented. The improved model of the company balanced indicators system is depicted in Fig. 3.

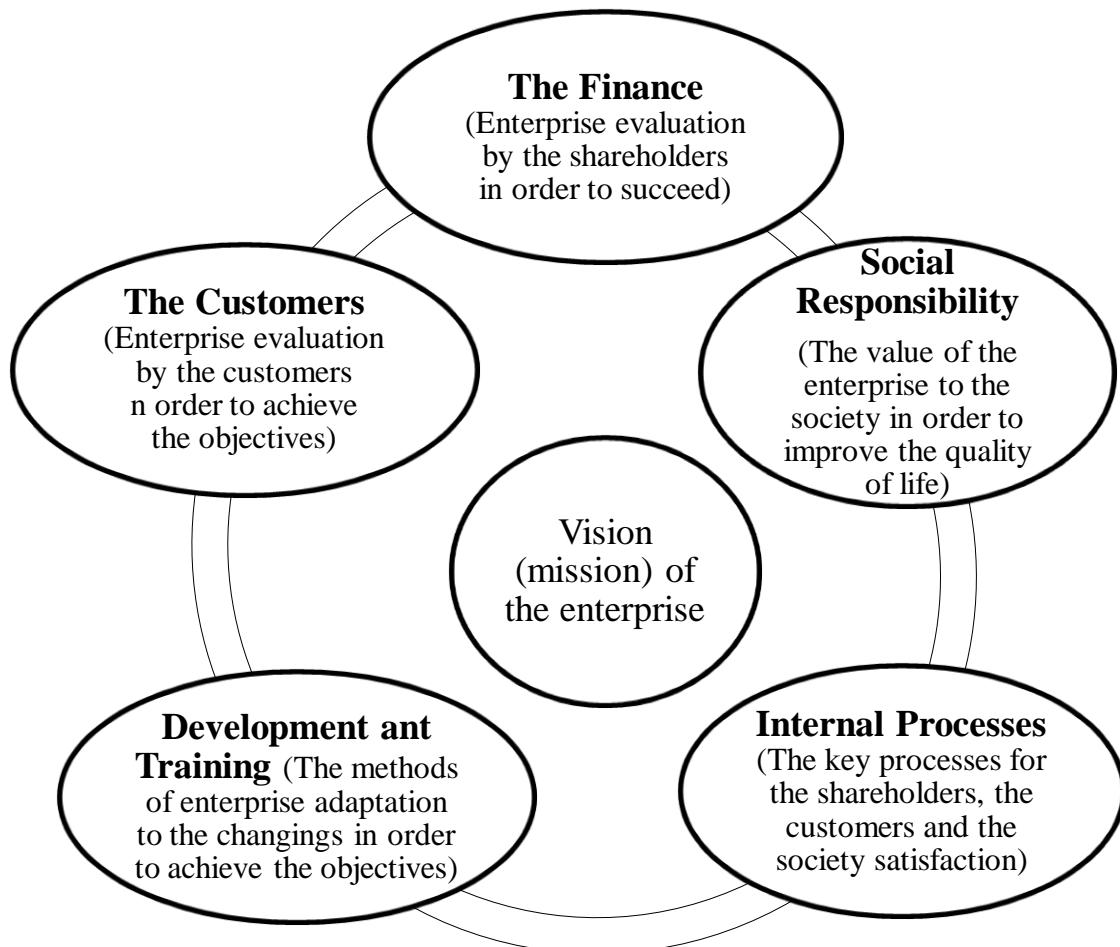


Fig. 3. The improved model of the company balanced indicators system
(author's development)

The evaluation of financial constituent of achievement of long-term aims of enterprise on the basis of model of BSC provides for analysis within the limits of strategy of financial goals, clarification of criteria and indexes of estimation and evaluation procedure. The strategic vision for the development of Motor Sich JSC is the strategy of growth based on large-scale diversification of production, strengthening and expansion of its positions in the market of aircraft engineering and helicopters, maintenance services. According to the mission and strategic concept, the growth strategy of Motor Sich JSC is realized on the following main strategic directions: formation and implementation of priority target programs for the creation of competitive products; expansion of markets and services; increasing the effectiveness of marketing activities; creation of effective high-tech production on the basis of its technical re-equipment; formation of an effective quality management system.

The main strategic objectives in the field of financial policy of Motor Sich JSC are: increasing the welfare of shareholders by increasing the market value of the enterprise; aggressive growth by expanding sales markets and services and effective marketing activities; increase in profitability of sales through the creation of competitive products based on an effective quality management system. Specifying goals and indicators characterizing the extent of their implementation are listed in *Tabl. 1*.

The calculation results of BSC financial component indicators of Motor Sich JSC and analysis of the actual tendency of their changes comparing to desired direction are given in *Tabl. 2*. The analysis of the financial component indicators at positive rates highlights at the same time the negative trend reflecting some problems in the enterprise.

Table 1

The indicators system of BSC financial component

Objectives	Indicators
Increasing the profitability of equity	Equity profitability
	Asset turnover
Reducing the cost of loan capital	The cost of loan capital
	The structure of loan capital
Search for new sources of funding	Interest rate on the loan
Income growth from sales of products and increase of market share	Market capacity
	The company share in the market
	Gross sales turnover ratio
Reducing operating costs	Production cost coefficient
	Administrative expenditure ratio
	Ratio of sales costs
Growth of net profit and profitability of sales	Net profit ratio
	Sales profitability
	Net profit per 1 ordinary share

Particularly, indicators such as equity profitability, sales profitability, net profit per share, asset turnover, which are the basis for assessing the financial situation of the enterprise.

On efficiency of management development of enterprise negatively a situation influences on global markets as a result the stake of enterprise grows short at the market for the last four years from 1,3 to 1,1 %, and also unfavorable macroeconomic situation which shows up in a price advance on electric power, to rising in price of cost of loan capital on 11 %.

On a background negative processes positive is an increase on the enterprise of efficiency of management operating charges. Yes, for probed period of the Motor Sich JSC. the coefficient of production prime price grew short almost in from times — from 2,27 to 0,84; coefficient of administrative charges — almost on the third part.

By an integral index financially economic there is a net income on one simple action, which has oscillation in the quantitative measuring, activity, and for the last year grew short higher 40 %, that specifies on backlogs of financial management in the system of achievement of strategic aims of enterprise.

Table 2

The indicators system of the BSC financial component of Motor Sich JSC *

Objectives	Indicators	Desired direction of indicator change	Calculation				Actual direction of indicator change	Trend
			year 2015	year 2016	year 2017	year 2018		
Increasing the profitability of equity	Equity profitability	increase	14,0%	15,3%	24,3%	12,9%	decrease	negative
	Asset turnover, times	increase	0,69	0,5	0,9	0,46	decrease	negative
Reducing the cost of loan capital	The cost of loan capital	decrease	28,4 %	31,7%	36,6%	39,4 %	increase	negative
Search for new sources of funding	Interest rate on the loan**	decrease	4,1%	16,7%	21,6%	15,1 %	increase	negative
Income growth from sales of products and increase of market share	Market capacity***	increase	<485	<485	>485	>485	increase	positive
	The company share in the market****	increase	1,3%	1,3%	1,2%	1,1%	decrease	negative
Reducing operating costs	Gross sales turnover ratio	increase	9,4%	25%	28,9%	- 23,7%	decrease	negative
	Production cost coefficient	decrease	2,27	1,51	1,21	0,84	decrease	positive
	Administrative expenditure ratio	decrease	0,49	0,50	0,53	0,30	decrease	positive
Growth of net profit and profitability of sales	Ratio of sales costs	decrease	0,34	0,36	0,24	0,39	increase	negative
	Sales profitability	increase	15,1%	14,8%	24,1%	18,9%	decrease	negative
	Net profit per 1 ordinary share	increase	634,84	750,90	1636,12	946,36	decrease	negative

* *Source*: it is made and expected from data of the statistical accounting [14].

** *Source*: it is made and expected from data of the statistical accounting [15].

*** *Source*: it is made and expected from data of the statistical accounting [16].

**** own calculations.

4. Conclusion. Investigating the components of the system to evaluate the management effectiveness and a set of interconnections, characterizing the indicators of internal and external efficiency of the company, it is possible to establish reasons a reduction in the management efficiency of the investigated company. The peculiarities of the economy of aviation company in the present conditions are determined: the high degree of state regulation and administration; a highly integrated nature of production, which requires a partnership model of production organization to minimize costs; high scientific content of air production; the competencies of the personnel become the leading capital in the process of complex production; synergistic effect of aircraft building in the field of mechanical engineering.

The following financial factors have a negative influence on the company ability to realize its strategic goal: reduction of equity and sales profitability; increase in the value of loan capital; decrease of sales volumes with simultaneous increase in sales costs; a reduction in the cost of innovation activities, as a consequence, low rates of implementation of advanced high-tech industries, operational imperfection and lag behind main competitors. It should be noted that the company success is a balance of components, rather than thoughtless concentration on quality, equity value, profit or other indicators, which reflect only a part of the meaning of the organization existence, financial indicators should balance the interests and the needs of customers, shareholders and company personnel.

The estimation of management efficiency after other constituents after a method allows to define the computer-integrated estimation of management efficiency and build the strategic map of aims of management of enterprise. The map of aims allows to discover and go into detail key problems on which it is necessary to give mind a management command, and their intercommunication, between itself.

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