
Innovative Production Accounting Segmentation in a Globalized Economy

Sharovatova E.A.,¹ Chukhrova O.V.,² Scherbakova E.P.,³
Martirosyan T.R.⁴

Abstract:

The article substantiates the influence of globalization of the world economy on the innovative enterprises management. In this regard, it also considers its impact on a specific feature of structuring the accounting resource.

The work is aimed at determining the main areas of structuring the accounting and analytical information in relation to innovation-oriented entities depending on internal and external factors influencing their economies.

It resulted in giving reasonable arguments to support the main policies of management accounting segmentation in commercial management system. Examples of management accounting objects within the framework of the proposed segments are presented and new management opportunities for innovative production are introduced.

This approach will allow a more accurate assessment of the costs of management objects in relation to the responsibility for arising costs for each management object. At the same time, a part of the accounting techniques are highlighted as typical for the management accounting system of any type of production, and some are individual and mandatory for the innovative type of production.

Keywords: *Globalization, external factors, internal factors, management accounting, accounting objects, costs, management, control.*

JEL Classification Codes: *D24, M11, M21, M41.*

¹Doctor of Science (Economics), Professor of Accounting Chair, Rostov State University of Economics, Rostov-on-Don, esharovatova@mail.ru

²Candidate of economic Sciences, associate Professor of Accounting Rostov State University of Economics, Rostov-on-Don, shuchrova@mail.ru

³Candidate of economic Sciences, associate Professor of Accounting Rostov State University of Economics, Rostov-on-Don, kosh_ka@bk.ru

⁴Postgraduate Student of Accounting Chair, Rostov State University of Economics, tigran-martirosy@mail.ru

1. Introduction

All over the world theoretical and applied techniques of information support for the results of innovation activities are the subject of interest both from commercial entities and legislators. If the interest of the first ones is explained by the direct influence of intellectual resources on the possibility of increasing their value added, the interest of the latter is due to a claim for the withdrawal of a part of the value added as an income tax to various levels budgets. In addition, the globalization of the world economy, accompanied by aggressive competition, demographic problems, turbulence of the market infrastructure leads to the situation when all innovation activities participants are interested in the long term technological leadership in the global economy (Akopova and Pzhedetskava, 2016).

However, the globalization of the economy has influenced the organization of accounting for all world integration participants. In order to unify the structure of financial statements, the methods of forming similar operations with assets and liabilities in the accounting were unified as well and it made calculation technologies less transparent and popular. At the same time, there are problems in accounting and analytical support structuring, they depend on various environmental factors, which together contribute to the improvement of innovation management techniques. The lack of striving for such improvement results in a lack of confidence in the progressive development of its own innovative technologies against the background of the development of new technologies of competitors. In this regard, the development of accounting and analytical segmentation of the innovation-oriented organizations management system structuring seems to be in demand.

The purpose of the work is to summarize the main approaches to the structure of accounting and analytical information regarding innovation-oriented entities, depending on the influence of internal and external factors on their economic environment and the basis for the main ways to management accounting unification in the commercial management system. To achieve the goals chosen the following tasks are to be solved:

- 1) to categorize the factors of internal and external impact on accounting and analytical support for organizations focused on the innovative products production;
- 2) to summarize the methods of segmentation of the accounting area for a commercial organization, which is a participant of innovation activity, depending on external and internal factors affecting the business;

The following hypotheses will be tested in the process of research in order to solve the problems stated:

H1: The influence of internal and external factors on the business environment of organizations using innovative technologies, causes the need in further expansion of accounting components of the management system.

H2: The key areas for the unification of management accounting in terms of innovative technologies depend on the decentralization of responsibility for the results of the top management economic policy.

2. Literature review

The development of a competitive environment in the global economy is accompanied by the search for adequate technologies in management, the possibilities of which are based on extensive knowledge in management accounting, controlling, budgeting, management analysis. The innovation production management requires certain knowledge not only of the components of the methodology of these subsystems of management, but also of the features of their implementation in the risky business segment. The works of such foreign authors as Upchurch (2002), Atkinson (2007), Harrison (2010), Daile (2001), Drury (2002), Kaplan (2006), and others triggered the study of modern management problems in relation to innovative production and the development of its accounting and information sphere.

Contemporaries of the Russian scientific school in the field of accounting and management accounting, control and analysis contributed to the expansion of the methodology and practice of information support for businesses focused on innovative production. Averchev (2002), Vakhrushin (2006), Vrublevsky (2005), Ivashkevich (2003), Karpova (1998), Kerimov (2009), Stroeveva *et al.* (2016) and others. These authors contributed to the understanding of the methods of transformation of accounting and analytical space, depending on different management needs. Considering the multifactorial influence on the choice of the management system under risky innovative production conditions, there is no doubt in the feasibility of forming a standard approach to the choice of accounting resource segmentation for each possible factor of influence on the efficiency of the new production.

3. Research Methodology

The general scientific methods, such as specification and generalization, comparison, formalization, analogy, logical and systemic approaches were used as research tools for this work. In the course of the study, particular methods of scientific knowledge such as the tabular method, the method of schematic structuring of information, the method of forecasting were applied.

4. Research results

The globalization of the economy is accompanied by merging of human potential and the capabilities of high-tech industries, which takes information technologies to a new level of development. The expansion of the raw material base in some countries in the 21st century together with its seeming shortage in others turns the

economy into a large-scale innovation process eliminating world problems. In this regard, management concepts and management technologies that can enhance the financial security of organizations and strengthen their competitive advantages have a special status.

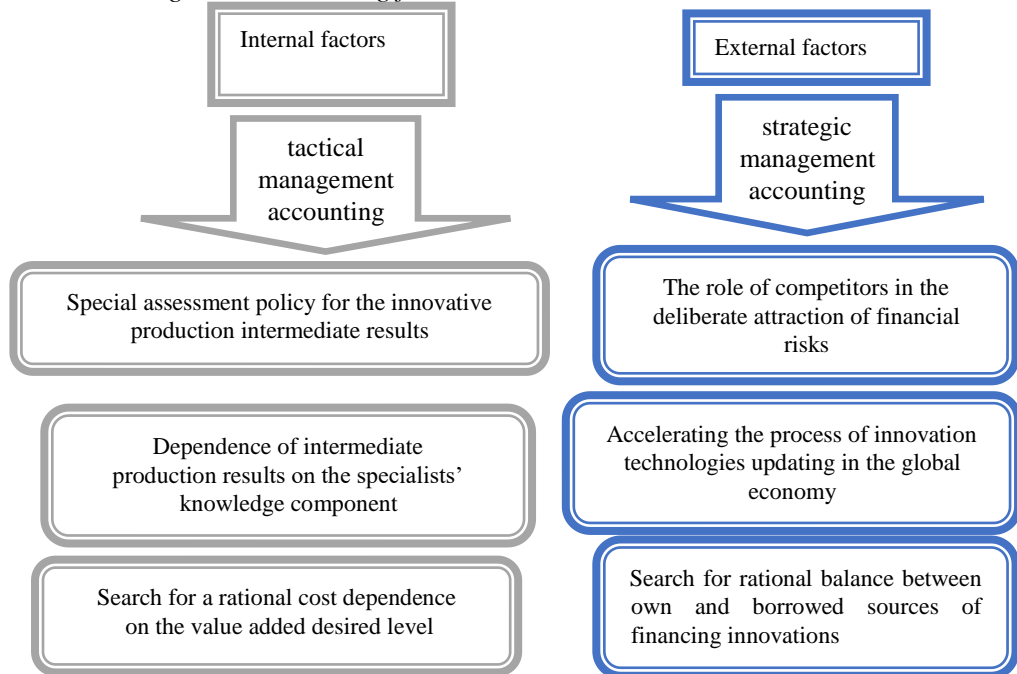
Thus, the aggressive environment of a competing market in the context of world globalization has launched a mechanism for the formation of a fundamentally new system of quality management. Undoubtedly, the consequences of globalization are accompanied by both positive and negative factors influencing the global economy, and lead to increased technological independence of some countries and its decline in others. However, there is still no alternative to such a threat in the modern world, and therefore the focus of management attention of the economic integration participants is on the search for a rational protection mechanism against financial risks in industrial production. Such a process becomes especially popular for innovation-oriented enterprises. It is explained by the fact that creation of the final innovative product often becomes a result of international integration of innovative production participants, but not that of global integration based on the exchange of goods, as it was before. Transfers of semi-finished products occupy a growing share of the final product cost. Due to the risk of damaging the image on the global trading platform, it creates even greater need for production financial guarantees.

Against this background, the modern influence of globalization of the economy on the management system is accompanied by the fact that the evolution of accounting methods does not fully keep pace with the evolution of the global economy, since innovations “in the field of accounting theory are lagging behind the objectively arising practical problems. The accounting practice suffers from growing entropy and significant lag behind the needs of the post-industrial economy” (Paliy, 2007). All of this creates the need for more detailed informing the owners of the production site about the intermediate results of innovative production, in its turn it influences the choice of the accounting and analytical support segments’ structure in relation to the production specified. The set of external and internal factors that influence the organization of segmentation when choosing a model of strategic and tactical management accounting for the innovation cost is schematically represented in Figure 1. Various factors affecting the effectiveness of innovation activities call for organizing information segmentation in the system of strategic and tactical management accounting in such a way to minimize the risks of value added losses for various external and internal reasons. With regard to management accounting techniques for developing an external development strategy, the information segments are the following:

- areas of activities with detailed elaboration of sales, costs and financial results for each of them in order to choose the most profitable one;
- distribution of income, expenditure and financial results on a territorial basis in order to focus the business on a more promising sales market;

- structuring of sales on seasonality grounds in order to find the most productive period to intensify of the activity;
- structuring of revenues according to the source of funding for sales in the context of commercial or budgetary customers in order to conduct a qualitative analysis of the payment obligations security and to make a shift to guaranteed customers.

Figure 1. External and internal factors influencing the organization of strategic and tactical management accounting for the innovation cost



As a result of the aggression of the external environment and, consequently, that of the external factors, the strategic management accounting is aimed at creation of an organization's business model, focusing on the strategy of profitability and cost-efficiency. However, tactical management accounting is no less important. In its framework the separation of segments is focused not so much on profitability as on duties and obligations of each of the participants of production and management process, on their marginal contribution to total profit and other internal value indicators. With regard to management accounting techniques for internal development tactics the information segments are the following:

- areas of financial responsibility for the costs of the organization in accordance with its functional management structure;
- cost centers in accordance with the linear management structure;
- technological production processes and supporting processes for servicing the main production;
- commodity groups or items (works, services) as off-the-shelf consumer products.

All these management accounting segments in aggregate are to ensure internal control of costs at the cost centers, as well as that of the responsibility for their level, and to facilitate the organization of budgeting in the context of all reproduction participants. Thus, in our opinion, the further world capital integration, bringing together global experience in new technologies, creating a production infrastructure that is sensitive to economic and political crises, the unification of standards and rules in the pursuit of financial operations transparency and other consequences of the globalization of the economy demand the creation of adequate information support for management system. The role of information segmentation for the purposes of strategic and tactical management accounting and control of the results obtained is not unimportant. Using the example of an innovative production, we can propose an accounting segments structure within the framework of management accounting focused on the innovative production management tactics. It is tactical management accounting that is of primary importance for innovative production today due to the fact that mass production has not yet begun, and the sales strategy will again be relevant after the completion of prototypes of products.

Demand for innovations in management accounting and control is a consequence of the development of new economy's needs as well as of its management. The development of innovative technologies resulted in introduction of a category of innovation, which at the beginning of the twentieth century was recognized as an object of management in the works of the world-famous economist J. Schumpeter. The modern approach to innovation as to an economic category reflects its richness in various cost components. For example, the Russian full member (academic) of APMEF Batkovsky (2012) reveals innovation, as "*a process of creating, mastering and distributing new or improved types of products, services, technologies, raw materials and materials, methods of production and management*" (Batkovsky, 2012).

The pursuit of innovation processes in the economy and their settlement at the international level is a part of the policy of the International Organization of European Economic Cooperation, established in 1948 and later renamed as the Organization for Economic Cooperation and Development (OECD). The Russian legislation has also rushed to the improvement of legislative regulation in the field of innovations. It resulted in the Main Directions of the Russian Federation Policy in the Field of the Development of the Innovation System, adopted in 2005.

All this was soon reflected at the regulatory level on the part of legislators who focused on new technologies costs accounting. Although in Russian practice this process only indirectly affects such a complex section of accounting work as synthesis of information on innovation activities of a commercial entity. Thus, in fact, only one of 24 accounting regulations, namely PBU 17/02 "Accounting of expenses for research, development and technological works", can be correlated with the accounting rules for cost-oriented innovations. However, this standard is not focused on the intermediate result of innovative production, does not specify the

procedure for evaluating innovative costs at various production stages, does not offer options for detailing costs between different management objects. These problems can be combined into a one common for all innovation-oriented organizations, namely: the lack of any typical model for choosing accounting segments in relation to innovative production for monitoring the intermediate results of risk-taking activities, the application of which is essential for in the management system. It refers mainly to management accounting, which in Russian practice is not accompanied by any methodological recommendations on the part of legislators.

International standards of management accounting are also not very informative in the sphere of innovations. Among several dozens of management accounting standards developed and recommended by the United States Institute of Management Accounting (SMA - Statements on management accounting), no single standard identifies management features in terms of detailing the costs of the primarily used technology of new production.

Thus, the current state of accounting technology at the level of current standards in world and Russian management practice is not focused on the accounting methods for effective and not efficient production costs, risk-oriented and non-risk-oriented costs, which is important for making decisions about the further innovative production. Such a need in classifying costs is especially urgent for the companies that have decided to launch new innovative products under conditions of serial mass production.

There are no traditional accounting mechanisms for detailing the administrative costs between serial and innovative production, so the accuracy of the calculation of the effectiveness of the first and second is doubtful. Accounting conventionality of the distribution of such costs practically blurs the line between innovative and non-innovative costs. In this regard, there is a need for special segments of cost accounting, which is not provided for by any accounting and reporting standards at the moment.

Key approaches to the choice of segments of managerial accounting for innovative production indicators are largely dependent on external and internal factors affecting new production. These factors create the risk of investors' production financial support loss.

Table 1. *Grouping of accounting segments in relation to innovative production depending on external and internal factors*

№ n/n	Accounting segment	Object of the accounting segment	Information result
	1.	External factors impact	

1.1.	“Settlements with customers on the basis of their economic reliability” segment	A segment of clients involved	Getting information about customers with an impeccable reputation in the market of suppliers and those with a dubious reputation.
1.2.	“Sources of innovations funding” segment	Obligations	Getting information for confidence in further business development
1.3.	“Risk-oriented costs for external reasons” segment	Regulated and non-regulated cost items	Identification of risk costs for external reasons
2. Internal factors impact			
2.1.	“Innovative projects” segment	Separate project	Identification of each separate project’s costs
2.2.	“Stages of innovation projects” segment	Project stage	Projects innovation costs control
2.3.	“Controlled costs for internal reasons” segment	Controlled and uncontrolled cost items	Identification of risk costs for internal reasons
2.4.	“Cost Centers” segment	Structural unit	Control of line managers professional suitability for a certain structural unit costs
2.5.	“Spheres of Financial Responsibility” segment	Center of financial responsibility	Control of top managers professional suitability for their cost responsibility areas (business processes)

Each of the proposed accounting segments contributes to the assessment of innovative production indicators. At the same time, some segments are universal and can be used for any commercial production, some are applied only for innovative technologies. But the information content of the accounting model is manifested in the totality of the entire set of segments for a new production.

The segment “Settlements with customers on the basis of their economic reliability” helps to obtain information about two types of customers: customers with an impeccable reputation in the market of suppliers and other customers for whom such confidence has not yet been obtained. When entering into contractual relationships with third parties, companies accumulate a history of relationships with counterparties, adding information to each counterparty about desired situations in the form of delays in the supply of inventories or equipment, cases of poor quality work or services, unexpected contractual terms changes or other cases of commercial ethics. Furthermore, after a certain period of time, such a history allows to create a segment of partners that are perfect for business and a segment of business partners with a dubious reputation. If it is necessary to implement an innovative project and select partners, the first information segment is most suitable because the products have not yet entered the stage of mass production and there is no airbag, for example, in the form of a reserve for covering possible losses due to an external factor.

The segment “Sources of innovations funding” assumes the distribution of sources to commercial, budgetary or other sources of innovative production funding (for example, targeted sponsors support) already at the stage of budgeting. All these sources are divided into returnable and irrevocable. This approach to the sources segmentation is based on the need in confidence in the risky business full financing taking into account the intentions for such funding. As funds are received from external parties (or by reserving own funds at the expense of the balance of accumulated retained earnings), information on the relevant characteristic of the “Sources of innovation funding” segment is reflected in management accounting. It will help to control the “cost – source” ratio and minimize potential risks.

The segment “Risk-oriented costs for external reasons” implies grouping costs in two segments, depending on whether external factors are regulated or non-regulated. Already at the stage of budgeting, almost all costs can be classified into costs dependent on these factors (thus poorly regulated by top management), not dependent costs (more regulated by top managers). For example, energy costs depend on the energy supplying companies’ tariffs, which makes such costs the most vulnerable one to external factors and poorly amenable to price regulation. The same is the situation with the tax liabilities cost, which depends on the economic and political circumstances in the country. Dependence on those contractual obligations for which contractual relations are completed in the short-term period and there is no confidence in their continuation with the same price parameters (or continuation in general) is of special interest.

Finally, the exchange difference obtained for obligations with foreign currency denominated value is the least regulated. Due to the unstable economic situation in the world, exchange differences often significantly affect the cash equivalents of costs and are least of all subject to regulation by top managers. It is in this connection that the segment of “risk-oriented costs for external reasons” will allow grouping costs at the stage of budgeting and management accounting for two - regulated or non-regulated - segments, to assess the degree of innovative production costs unpredictability. The segment “Controlled costs for internal reasons” also implies grouping of costs into controlled and uncontrolled, depending on the degree of managerial influence. For example, according to their centers costs are grouped for certain structural units, but not all costs are manageable by managers of a particular department.

Thus, the assembly shop staff training costs are considered as a part of the costs of this workshop, but the costs themselves are not included in the control sphere of the head of this workshop and are not controlled by him. Functionally, such costs are controlled by the head of the personnel department, whose sphere of responsibility includes controlling all personnel costs, including training and further training expenses. Or, for example, the amount of costs for equipment repair in the workshop is controlled not by the head of this workshop, but by the chief engineer of the enterprise. For new production, such segmentation of costs for controlled and non-

controlled ones will result in more accurate assessment of budget limits deviations regarding certain management participants. This segmentation is possible only in combination with the segments “Cost Centers” and “Spheres of Financial Responsibility” that are customary for management accounting of industrial production. The first ones group costs in accordance with the places of primary cost incidence, the second - by areas of responsibility for specific business areas (logistics, accounting, production, marketing, social services, etc.).

The objects of management accounting of the first segments are structural units led by line managers, the objects of management accounting of the second ones are business processes led by top managers. This approach to accounting information grouping is a typical control element in both international and Russian management multi-level production management practice. These segments together with the “Controlled costs for internal reasons” segment will exclude uncontrollable costs in innovative production.

The “Innovative projects” segment involves grouping innovative costs by projects, since each of them is focused on a specific source development program, difference in the sources themselves, different costs budgets for each project, time intervals from the moment the right of know-how is granted to the moment the production of a new product is launched. Specification of costs starts at the stage of project budgeting. It means that planned and factual deviations in system management accounting will be indicated. Such deviations are elements of the world known “deviation management” technology. However, the “innovation projects” segment will be informative for management only in combination with such internal segment as that of “Stages of innovation projects”. Each stage of innovative production is a unique specific stage of a new production process, which will not be an exact copy of the mass production costs stage.

Thus, the economic superiority in the global competitive environment of innovation activity participants can be supported by accounting and analytical management information referring to various kinds of segments, which imposes certain requirements on the innovative production accounting model. In general, the accounting model should be based on the principle of cost sharing according to risk factors and creating an individual accounting segment for each factor. This will provide an opportunity to assess the degree of risk, the acceptable level of segment costs and evaluate the functional responsibilities of specific top managers regarding the management results.

5. Conclusion

Thus, innovative production, as the most sensitive to various factors, requires a special approach to the segmentation of the accounting resource, contributing to the assessment of the feasibility of investing innovative costs. A particular detailing of the accounting segments is explained by the dubious confidence in the creation of

such a product, which is expected in the consumer market amid the pressure of external and internal factors of micro and macroeconomics. In this case strategic management accounting is intended to ensure the choice of management strategy in situations initiated by external influence on the indicators of innovative production, while tactical management accounting is used for the choice of management tactics in situations initiated by internal influence on innovative production. Table 1 shows a set of accounting segments for innovative production, the combination of which will help to reduce the risk of undesirable impact of various factors on the economy of the enterprise (Nikolova *et al.*, 2017).

The internal control system is not less important for the management system. It can be used to assess the rationality of the innovation-oriented enterprise accounting policy. In this regard, the problem is solved by choosing control points in the internal control system, contributing to confidence in the protective functions of the accounting system for management as a whole.

References:

- Akopova, S.E., Przhedetskaya, V.N. 2016. Imperative of State in the Process of Establishment of Innovational Economy in the Globalizing World. *European Research Studies Journal*, 19(2), 79-85.
- Atkinson, E.A., Bunker, R.D., Kaplan, R.S., Young, M.S. 2007. *Management Accounting*. Moscow, Williams Publishing House, 874 p.
- Averchev, I.V. 2011. *Management accounting and reporting. Staging and implementation*. Moscow, Reed Group, 416 p.
- Batkovsky, A.M. 2012. General characteristics of the innovation activity of economic systems. *Economic Relations*, 1(3), 3-9.
- Daile, A. 2001. *Practice controlling*. Moscow, Finance and Statistics, 336 p.
- Drury, K. 2002. *Introduction to management and production accounting*. Moscow, UNITI, 783 p.
- Harrison, R. 2010. *Management Accounting*. SPb., Peter publ., 592 p.
- Ivashkevich, V.B. 2003. *Management accounting*. Moscow, Economist, 618 p.
- Kaplan, R. 2006. *Strategic unity*. Moscow, Williams, 384 p.
- Karpova, T.P. 1998. *Management Accounting*. Moscow, Audit, UNITI, 350 p.
- Kerimov, V.E. 2009. *Management accounting*. Moscow, Dashkov and K, 477 p.
- Nikolova, V.L., Rodionov, G.D., Afanasyeva, V.N. 2017. Impact of Globalization on Innovation Project Risks Estimation. *European Research Studies Journal*, 20(2B), 396-410.
- Paliy, V.F. *Accounting Theory: Current Problems - M: Accounting*, 2007.
- Stroeva, O.A., Mironenko, V.N., Lyapina R.I. and Petrukhina, V.E. 2016. Peculiarities of Formation of Socially Oriented Strategy of Economic Growth of National Economy. *European Research Studies Journal*, 19(2), 161-170.
- Vakhrushina, M.A. 2006. *Management accounting*. Moscow, Omega-L, 576 p.
- Vrublevsky, N.D. 2005. *Management accounting*. Moscow, Accounting, 400 p.
- Upchurch, A. 2002. *Management Accounting: Principles and Practice*. Moscow, Finance and Statistics, 952 p.