

# THE ROLE OF THE ACCOUNTING ASPECT OF INNOVATIVE ACTIVITIES OF REGIONAL ENTERPRISES IN ENSURING THEIR ECONOMIC SUSTAINABILITY

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**Abstract.** In a world of rapid and continuous change and constant competition, innovation is becoming an important element in the sustainable development of companies and regions. A key factor in the success of innovation processes is the accounting aspect, which involves the systematisation, analysis and documentation of innovative changes. The study of this topic is becoming increasingly relevant due to the need to identify and solve problems related to innovation accounting. It aims at combining two strategically important areas – innovative development of enterprises and modern approaches to accounting and financial management. *Purpose of the article.* The purpose of the publication is to identify the key aspects of the problems associated with accounting for innovation activities at enterprises, as well as to reflect the role of such accounting in ensuring their economic sustainability. *Methodology.* The methodological basis of the work was formed by general scientific and special research methods: comparison, analysis, generalisation, graphic and tabular. The information base is based on official statistics, company reports and accounts, Internet resources and publications, and the results of the authors' own research. *Practical implications.* The research examines the problems of accounting for innovation activities of enterprises and makes proposals for their solution. The Ukrainian legislation regulating accounting lacks a coherent methodology for accounting for innovation costs. In order to provide the necessary analytical information on the costs of innovation activity, it is recommended to use accounts of the eighth class, opening sub-accounts of the third, fourth and higher order. *Value/originality.* The sources of financing and peculiarities of accounting for innovation activities of enterprises are studied, the main of which are the state resources and resources of enterprises and other business entities. Among the non-traditional sources of financing are venture capital funds, business incubators, business angels and crowdfunding.

**Keywords:** innovation, sustainable development, management, enterprise, accounting aspect, account.

**JEL Classification:** O31, O18, L53, O12, M41, M49

## 1. Introduction

In today's world of dynamic change and constant competition, innovation is becoming an essential element in the sustainable development of companies and regions. An important factor in the success of innovation processes is the accounting aspect, which involves the systematisation, analysis and documentation of innovative changes. Modern financial statements presented by companies face difficulties in reflecting information that highlights accounting aspects directly related to innovation activities. In addition, financial reporting indicators related to

information on invested transactions are rather general and insufficient to draw accurate and reasonable conclusions about innovation financing transactions and the risks associated with such financing. This also makes it difficult to carry out an effective analysis of a company's financial position.

The study of this topic becomes relevant due to the need to identify and solve problems related to ensuring the economic sustainability of enterprises in the region. It combines two strategically important areas – innovative development of enterprises and modern approaches to accounting and financial management).

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Foreign and domestic scientists have made an important contribution to the study of aspects of accounting for innovation activities of enterprises in Ukraine, in particular, their functioning. When analysing the necessary sources, it becomes clear that, despite the large number of scientific works, many problems related to accounting for innovation are still the subject of active discussion, are not sufficiently considered and require additional research.

## 2. Clarification of the Conceptual Apparatus of Innovation Activities of Enterprises

Innovation is an area of economic activity that has become particularly vulnerable to the crisis. Today's market is characterised by a situation in which innovation, which used to be funded from centralised sources, has suffered a significant decline, while investment with an internal structure has lost its organisation and become unregulated, focusing only on achieving the short-term objectives of investors. The way out of this situation is to overcome the economic crisis through an innovation and investment boom, which involves the renewal of fixed capital on a new, competitive basis.

It should be noted that in some cases, authors of modern Ukrainian publications on innovation point out that the emergence of new terms can often be due to the subjectivity of translators. For example, in their monograph "Technology transfer as a tool for implementing innovative activities", O. Androsova and A. Cherep argue that "the words 'novelty' and 'innovation' are identical in meaning, a variant of the English word 'innovation' is a complex process of creating, disseminating and using an innovation that is constantly evolving and contributes to the development and improvement of firms' activities" (Androsova, Cherep, 2007).

It is worth noting that innovation is defined as the introduction of something new into business practice. In other words, from the moment an innovation is adopted for dissemination, it acquires a new character and becomes an innovation. Thus, innovation "...is not just a concept that means any innovation, but a new function of production. It is a historically significant and necessary change in the technology of production. An innovation is a leap from the old production function to the new one, but not every new production is an innovation." (Bazhal, 1996)

Pursuant to paragraphs 2 and 3 of Article 327 of the Commercial Code of Ukraine, types of innovation activity are defined through its areas and classified by the following components:

- Conducting scientific research and development aimed at creating intellectual property objects and scientific and technical products;

- development, introduction, production and distribution of fundamentally new types of equipment and technologies;
- development and implementation of new resource-saving technologies aimed at improving the social and environmental situation;
- technical re-equipment, reconstruction, expansion, construction of new enterprises carried out for the first time as industrial development of new products or introduction of new technologies;
- investments in the reproduction of fixed assets and increase in inventories are treated as capital investments.

It can be said that innovation activity is the activity carried out by people to create or implement innovations at a certain stage of the innovation process.

The innovation process is broader than the concept of innovation activity, as it covers all stages of creating an innovative product: from an idea to a specific product, technology or service used in business activities. It also covers all stages of the innovation life cycle, including its diffusion into new environments or areas of application.

In general, the innovation process involves the commercialisation of inventions, new technologies, products and services, organisational, technical, economic, social or other solutions, as well as other intellectual property results, and is carried out in four stages.

At the first stage, basic research is carried out in agricultural research institutions, higher education institutions and industry-specific specialised institutes, as well as laboratories. Funding is provided mainly from the state budget on a non-refundable basis.

The second stage is characterised by applied research in various scientific institutions, funded both by the state budget (through state research programmes or competitive initiatives) and by customers. The results of such research are not always predictable and, at this stage, are associated with uncertainty and the possibility of negative results. This stage creates potential risks of losing the invested funds, and investments in innovation at this stage are characterised by a risky nature and are called risk investments.

The third stage covers research and development and experimental development carried out in specialised laboratories, design offices, experimental production facilities and in the research and production units of large industrial organisations. Funding for this stage is the same as for the second stage, including the organisations' own resources.

The fourth stage is the commercialisation process, which begins with the start of production and the launch of innovative products.

At the intersection of the third stage and market entry, significant investments in production are usually required to create (expand) production capacity, train personnel and other aspects. At this stage of

the innovation process, the market reaction to the innovation is still uncertain and there are risks of rejection, so the investment remains risky.

Thus, the company's innovation activities are traditionally implemented through innovation initiatives and investment projects in order to reduce production costs, ensure product competitiveness and improve the efficiency of the company's operations. Innovation activities are aimed at the practical application of scientific and technological achievements and intellectual potential to create a new or significantly improved product, its production technology and to meet the effective demand of consumers for high-quality goods and services and to improve social services.

### 3. Peculiarities of Accounting for Financing of an Enterprise's Innovative Activity

To increase competitiveness, companies need to respond to new market needs, which is impossible without introducing innovations. The main source of financing for innovative projects is the company's profit. In the case of external financing, investors expect information on the efficiency of the use of their funds, which requires proper accounting and reporting of the financing received by the company.

Investments are one of the sources of financing innovation activities. Pursuant to Article 326(1) of the Commercial Code of Ukraine, investments in innovation activities are made in the following forms: long-term investments of various types of property, intellectual property and property rights in business

objects to generate income (profit) or achieve other social effect.

Bank loans are the main source of financing for enterprises engaged in innovative activities as part of the modernisation of fixed assets. However, for enterprises developing innovative products, this type of financing is limited due to the long payback period and increased risk of such projects. This is reflected in the accounts in the form of loans received (Table 1).

Financing through non-traditional (alternative) instruments such as venture capital funds, incubators, business angels and crowdfunding represent an additional reserve for innovative development (Table 2).

Venture capital funds bring together investors whose contributions form venture capital, a source of finance for innovative projects. Various entities can invest in such funds, such as corporations, companies, insurance companies, individuals, banks, etc. Investments are made in risky innovative projects that do not always guarantee an economic impact. Such investments cover different economic sectors and unrelated projects. Venture capital investments can be made through the acquisition of shares in a company or the provision of a long-term investment loan (Table 3).

In the first case, the result of such investments is the payment of dividends, and in the second case, interest on the loan.

A business incubator is an institution that provides specially equipped premises and other resources to start-up entrepreneurs for a limited period of time

Table 1

#### Accounting for obtaining credit resources for innovation activities

Business transaction	Debit	Credit
The loan is for a specific purpose and is immediately credited to the supplier's account	63	50, 60
Acquisition of a non-current asset (innovative product) from a supplier or creation of a non-current asset (innovative product) by a contractor	15 641	63
Recognition of acquired non-current asset (innovative product)	10, 12	15
Interest accrual for the use of the loan	951	684
Repayment of the loan and interest	50, 60, 684	311

Table 2

#### Comparative analysis of non-traditional sources of financing

Investment method	Limitations	Advantages	Disadvantages
Venture capital funds	Selection of projects based on business plans	Activities aimed at the most risky investments	The possibility of the company losing control over its own project
Business incubators	Mentors for SMEs	Invest intellectual capital	It does not help in the search for direct investors
Business angels	Required return on investment or equity stake (blocking stake)	Optimisation of the current business model, determination of the project's place and prospects in the market	Insignificant contribution to the capital
Crowdfunding	Interaction takes place online on specialised platforms or in social media	Attraction of non-refundable, free investments with simultaneous advertising of an innovative product	If a project fails to raise the declared amount, it does not receive funds, as they are returned to investors

Table 3

**Accounting for venture capital investments in a company that attracts investments**

Business transaction	Sale of company shares		Long-term investment loan	
	Debit	Credit	Debit	Credit
Receipt of venture capital funds	46 31, 10, 11, 12	404 46	31, 10, 11, 12	505, 506, 53, 55
Accrual of dividends to shareholders or interest on borrowings	443	671	95	684
Payment of accrued dividends or interest	671	311	684	311

Source: (Kucherenko, Ratushna, Melnyk, 2019)

under certain conditions. The purpose of business incubators is to support the initial development of SMEs and help them become financially independent. Incubators can support different types of enterprises.

One of the most popular forms of financing innovative projects is raising funds from "business angels" – individuals. These individuals, who have their own financial resources, invest them in risky innovative projects in order to obtain a stake in such enterprises or to return the invested funds.

Crowdfunding is one of the new ways to raise funds for innovative projects.

Crowdfunding is a form of crowdsourcing that involves raising free financial resources from a wide range of individuals, such as individuals and micro-investors. These individuals, acting in their own interests, provide financial support to various projects (commercial and non-commercial, including social, political and cultural), mainly through the global Internet, without receiving or with the subsequent receipt of non-financial rewards from investors.

Depending on the type of reward for participants, crowdfunding is divided into the following categories:

- Without remuneration;
- with non-financial rewards;
- with financial rewards (known as crowdfunding).

The first two options are typical for investing in innovative projects in the field of social and charitable

initiatives. As for entrepreneurial activities, the third type is characterised by financial rewards.

Crowdfunding, as an aspect of crowdfunding, is the process of attracting free financial resources from a wide range of people, such as individuals and micro-investors with their own interests. This process is aimed at financing mainly commercial projects via the global Internet, with the subsequent receipt of financial rewards for investors.

The following forms of crowdfunding are distinguished by the type of financial reward received by participants in various projects: royalty model; people's lending (crowdfunding); equity crowdfunding.

In the royalty model, an investor on a crowdfunding platform acts as one of the co-founders of any author's innovative project and, in addition to receiving non-financial rewards, receives a portion of the project's funding.

The essence of crowdfunding is that individuals provide loans for innovative projects of individuals and legal entities with the condition that they are repaid and interest is paid. The borrower receives a loan at a reduced interest rate and a simplified procedure. In essence, this form of crowdfunding is a type of lending by individuals with small capital to innovative projects offered on a relevant crowdfunding platform (Table 4).

Table 4

**Crowdfunding accounting**

Business transaction	Debit	Credit
Receipt of long-term borrowed funds	311	55
Accrual of interest on long-term liabilities	95	684
Repayment of long-term liabilities	55	311
Repayment of interest on long-term liabilities	684	311

Table 5

**Accounting for equity crowdfunding**

Business transaction	Share in the capital of the issuing company		Sale of company shares	
	Debit	Credit	Debit	Credit
Investor contributions made	31	46	31	46
Increase in equity capital	46	40	46	40
Accrual and payment of part of the profit to participants or dividends	443 672	672 31	443 671	671 31

Source: (Kucherenko, Ratushna, Melnyk, 2019)

Equity crowdfunding involves the investor receiving a share of ownership or shares in the company, as well as the right to vote at the general meeting of shareholders. In both cases, there are changes in the equity of the issuing company (Table 5).

Thus, financing of innovative activity of enterprises is a complex and multifaceted process that reflects the close interconnection of all its subjects. Its purpose is to attract and efficiently allocate various financial resources to solve production tasks aimed at ensuring the innovative activity of a business entity.

#### **4. Directions for Improving the Accounting of Innovative Activities of Enterprises in the Context of Ensuring Their Economic Sustainability**

One of the main drawbacks of the current system of accounting for innovation costs is the lack of a unified system of accounting registers and accounts to correctly reflect the costs and financial results associated with innovation activities.

It should be noted that the analytical accounting of innovation costs should take into account different types of innovation: research and development costs; costs of producing a new type of product (product innovation); costs of developing a new technology (technological innovation); costs of organisational and managerial innovation.

However, one should not exclude the possibility of keeping analytical records of innovation costs in different areas of innovation activity, such as internal R&D; acquisition of R&D (external R&D); acquisition of machinery, equipment and software; acquisition of other external knowledge.

Regarding the regulatory framework for accounting for innovation costs in domestic legislation, it should be noted that there is no approved unified methodology for accounting for such costs in Ukrainian accounting. In Ukraine, the accounting of innovation costs is scattered among various regulatory documents. The current expenses of innovation activities are accounted for in accordance with AR(S) 16 "Expenses" and account 941 "Research and development expenses" is used to summarise the innovation expenses for the period. The related capital expenditure is accounted for in accordance with AR(S) "Intangible Assets" and AR(S) "Property, Plant and Equipment".

In accordance with the Law of Ukraine "On Innovative Activities", the objects of innovative activities are as follows:

- Innovative programmes and projects;
- new knowledge and intellectual products;
- production equipment and processes;
- production and business infrastructure;
- organisational and technical solutions of a production,

administrative, commercial or other nature that significantly improve the structure and quality of production and/or the social sphere;

- raw materials, means of their extraction and processing;
- marketable products;
- mechanisms for the formation of the consumer market and sales of commercial products.

It is these objects of innovation activity that should be primarily reflected in accounting, where information on costs is accumulated. It is clear that the allocation of innovation accounting should be more specific and linked to the current methodology of accounting for costs by item and element, which are further detailed within management subaccounts.

Another difficulty is separating costs that are related to innovation from those that are not. The Ukrainian financial accounting system does not provide clear methodological principles for accounting for the processes of creation and use of innovations. The objects of innovation accounting do not have proper accounts in the accounting system. Information on innovation objects is formed on the basis of general accounts without taking into account the specifics of innovation processes. Many enterprises do not keep internal accounting registers that would allow them to track the economic performance of innovation activities. The annual accounts do not contain items that would reflect the income, expenditure and results of the enterprise's innovation activities.

To address this issue, researchers suggest different methods of grouping innovation costs in the accounts. These include the use of management sub-accounts of account 941 "Research and development expenses", the use of special sub-accounts for intangible assets, sub-accounts for production costs, sales and administrative expenses. The possibility of using special sub-accounts for prepaid expenses is also being considered.

All these proposals have a significant drawback – they do not guarantee the creation of a unified cost accounting system throughout the entire life cycle of innovation. Effective innovation cost accounting should simultaneously take into account the objects (types of innovations) and phases (processes) of the innovation cycle:

- Idea generation;
- design and development work;
- production of an experimental sample;
- mass production;
- introducing a new product based on cost-effectiveness;
- costs of large-scale launch of new products;
- formation of funding sources for further innovations.

Furthermore, most of these proposals use an unsuccessful methodological approach of using synthetic balance sheet accounts with the introduction of third-order sub-accounts to produce management accounting. This overloads and complicates the

synthetic accounts with excessive detail, making the analytical accounting system unduly complex, cumbersome and inflexible.

The use of account 941 "Research and development expenses" with the introduction of additional sub-accounts for in-depth analysis is not sufficient to fully describe all innovation processes. This is due to the fact that the accounts of class 9 "Operating expenses" are only used to record the current expenses of the reporting period, and the investments in innovation activities are recorded separately from this account.

In view of the above, it is recommended that the types of innovations in the accounting system should be coded on management subaccounts. To account for the costs of innovation, it is proposed to use accounts of class 8 "Costs by elements", disclosing management subaccounts of the third, fourth and more order in accordance with the following principles:

1. The main goal of building a system of accounting and analytical information on costs should be to focus on innovation.

2. The formation of cost elements for management purposes should be carried out in as much detail as possible, in accordance with the principles of purity and uniformity of costs. The item "other expenses" should be practically absent, and its impact on the total amount of expenses should be determined as insignificant.

3. Types of expenses should be reflected by cost carriers (places of origin – cost centres). This is achieved by using a cost centre code – a subdivision within the account. The management cost code should combine the necessary classification features depending on the management objectives and the specifics of the innovation activity at the enterprise.

Consider a simple example. To account for the costs of high-strength steel grade 05N21M8T3K for the production of prototype C, a coding system is used. The main production shop will be assigned code 01, and the other shops will be assigned codes 02 and 03. Workshop No. 5, which manufactures the prototype, will receive code 05. For the material cost element of the prototype, assign code 801-05, which will indicate the place where the costs are incurred (cost centre). To provide additional information about the type of materials used, a code must be entered. For example, innovative product C will be coded as code 7, and the cost of steel grade 05N21M8T3K will be coded as code 9. Thus, the material cost element under code 801-05-7-9 will reflect "the cost

of steel grade 05N21M8T3K for the production of prototype C" (Table 6).

The proposed method of coding accounts of the 8th class allows to integrate management analytical accounts into the financial accounting system, avoiding excessive burden of synthetic accounting. At the same time, this approach provides flexibility, information and efficiency. With the use of modern IT technologies, this method is particularly effective for accounting for innovation costs. Information technologies allow systematising accounting information on innovation costs by any code (cost centre, product type, cost element, etc.) for any period of time. This significantly reduces the time and labour costs for staff to prepare additional estimates, analyses, calculations and internal reports to provide managers with the necessary information on innovation costs for making management decisions.

**5. Conclusions**

Thus, theoretically, innovations are a key factor in the development of enterprises and economic systems in general. They determine competitiveness and the ability to adapt to changes in the modern world.

The publication considers clarification of the concepts of "innovation", "innovation activity" and "innovation process", which will allow determining the appropriate strategy for enterprise development, depending on the prevailing type of innovation. In addition, this will facilitate the creation of a system and organisational forms of management, forecasting and modelling of the enterprise's behaviour with respect to the introduction of its innovative products in the market.

The sources of financing and peculiarities of accounting for innovation activities of enterprises are studied, the main of which are the state resources and resources of enterprises and other business entities. Among the non-traditional sources of financing are venture capital funds, business incubators, business angels and crowdfunding.

The article studies problems of accounting of innovation activity of enterprises and provides proposals on their solution. The Ukrainian legislation regulating accounting lacks a comprehensive methodology for accounting for innovation costs. In order to provide the necessary analytical information on innovation expenditures, it is recommended to use accounts of the 8th class, opening subaccounts of the third, fourth and higher

Table 6

**Accounting for innovation activity costs**

Business transaction	Debit	Credit
Steel grade 05N21M8T3K was used in workshop No. 5 to produce a prototype of product C	23 801-05-7-9	801-05-7-9 201

orders. The code of these subaccounts should combine the necessary classification features of the objects of innovation activity by centres

of responsibility, depending on the management objectives and the specifics of innovation activity at the enterprise.

## References:

- The Commercial Code of Ukraine dated 16.01.2003 No. 436-IV. Available at: <https://zakon.rada.gov.ua/laws/show/436-15#Text>
- The Law of Ukraine "On Investment Activity" of 18.09.1991, No. 1560-XII. Available at: <https://zakon.rada.gov.ua/laws/show/1560-12#Text>
- The Law of Ukraine "On Innovation Activity" of 04.07.2002, No. 40-IV. Available at: <https://zakon.rada.gov.ua/laws/show/40-15#Text>
- Avytkina, M. A. (2009). Accounting for innovation costs: state and directions of development. *Accounting and Audit*, Vol. 7, p. 44–52.
- Andronova, O. F. (2007). Technology transfer as a tool for implementing innovative activities: monograph. Kyiv: Kondor, 356 p.
- Atamanova, Y. E. (2008). Economic and legal support of innovation policy. Kharkiv: FINN, 206 p.
- Bazhal, Y. M. (2006). Economic theory of technological change. Kyiv: Zapovit, 240 p.
- Vasylchuk, I. (2013). Crowdfunding and crowdinvesting as financial innovations. *Securities Market of Ukraine*, Vol. 11–12, p. 59–67.
- Kolodaznaya, I. V., & Borblik, K. E. (2017) Sources of financing of innovative activity of enterprises of Ukraine. *Economy and Society*, Vol. 9, p. 448–453. Available at: [https://economyandsociety.in.ua/journals/9\\_ukr/77.pdf](https://economyandsociety.in.ua/journals/9_ukr/77.pdf)
- Kucherenko, T. E., Ratushna, O. P., & Melnyk, L. Yu. (2019). Accounting for Financing of the Enterprise's Innovation Activities. *Accounting and Finance*, Vol. 1 (83), p. 35–43. DOI: [https://doi.org/10.33146/2307-9878-2019-1\(83\)-35-43](https://doi.org/10.33146/2307-9878-2019-1(83)-35-43)
- Nebrat, V. V., & Korniiaka, O. V. (2022). Peculiarities of capital formation and investment mechanisms in Ukraine as a factor of financial risks in the war and post-war period. *International scientific journal "Grail of Science"*, Vol. 16, p. 31–34. DOI: <https://doi.org/10.36074/grail-of-science.17.06.2022.001>
- Irfan, M., Khan, S. Z., Hassan, N., Hassan, M., Habib, M., Khan, S., & Khan, H. H. (2021). Role of Project Planning and Project Manager Competencies on Public Sector Project Success. *Sustainability*, Vol. 13(3), p. 1421. DOI: <https://doi.org/10.3390/su13031421>
- Brownsword, R. (2021). Law, innovation and technology: fast forward to 2021. *Law, Innovation and Technology*, Vol. 13, Issue 1, p. 1–28. DOI: <https://doi.org/10.1080/17579961.2021.1898298>
- Rudra, P. (2023). Does foreign aid affect innovation and institutional quality in middle-income countries? *Evaluation and Program Planning*, Vol. 100, October, p. 332–340. DOI: <https://doi.org/10.1016/j.evalprogplan.2023.102340>

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