THE THEORETICAL BASIS OF THE METHODS OF ACCOUNTING ANALYSIS OF THE EFFECTIVENESS OF ENTERPRISE MODERNIZATION WITHIN THE CONCEPT OF MAINTAINING FINANCIAL AND PHYSICAL CAPITAL

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Abstract. One of the decisive conditions for ensuring a high level of competitiveness is modernizing production processes. Exactly due to the modernization, enterprises can maintain an up-to-date level of their engineering and technological potential, ensure product quality, achieve a high labor productivity and access to international markets. Although modernization is the most important aspect of any enterprise activity, it has not been considered as a special object of accounting and analysis up to the present. This research is devoted to the elimination of this shortcoming. The goal is to indicate the possibility of applying the accounting methods and analytical tools to generate reliable data on business processes, which are typical for modernization, as exceptional objects of accounting and analysis. Emphasis on the modernization and the identification, with its business operations, has a special value in the decision-making process for developing a business, using intensive factors of economic growth. This research is focused on the development of a number of methods of audit analysis, which we can be applied when obtaining a quantitative assessment of the effectiveness of business processes and investments in enterprise modernization. This research is based on the study of scientific literature and the application of theoretical methods of comparative analysis, critical evaluation, systematization and generalization. The obtained research results give a possibility to improve the economic analysis of the enterprise. This makes it possible to detect hidden trends in the development of business entities, prevent crisis situations, strengthen the importance of prognostic functions, comprehensively research and evaluate the performance of business entities in general and in the field of modernization, in particular.

Keywords: *enterprise modernization, accounting, audit, analysis.*

JEL code: M4

Introduction

The objectivity and necessity to modernize Belarusian economy are determined by the requirements of "survival" in terms of the fastly growing level of competition and technological superiority of individual countries, which have chosen an innovative development path. In the context of the global recession, the potential of the growth of traditional goods export is very limited. There used to be mainly a competition in the production of traditional products, focusing on improving quality and developing technical and economic characteristics. Those who create a new product and, accordingly, a new market, receive super-profits until the analogues of competitors appear.

Since the investment of funds and their rational use is an important condition for effective functioning and successful development, the most important task of the government and enterprises is to increase the economic efficiency of the ongoing modernization. Assessing the effectiveness of enterprise modernization is the most considerable step in making decision on the feasibility of implementing an investment project. The time scales of the return on invested capital, its profitability and the pace of development of the enterprise depend on how objective and comprehensive the analysis is.

Various aspects of the inclusion of information on enterprise modernization in the accounting and reporting are considered in the works of foreign and domestic authors: S. G. Vegera, M. I. Kuter, S. G. Korotaev, N. I. Ladutko, V. F. Paly, D.A. Pankov, P.G. Ponomarenko, M.L. Pyatov, J. Rishar, A.P. Shevlyukov, V.G. Shirobokov and others. General issues of economic efficiency of enterprise modernization were investigated by L.L. Ermolovich, T.B. Berdnikov, L.S. Vasilyeva, M.V. Petrovskaya, D.V. Lysenko, D.A. Endovitsky, V.I. Makaryeva, L.V. Andreeva, G.V. Savitskaya, V.I. Strazheva, A.D. Sheremet, R.S. Sayfulin. Theoretical and methodological issues of the economic content of the concept "enterprise modernization" are considered in the studies of Belarusian authors: A. E. Daineko, L. M. Kryukov, V. S. Protasenya, V.N. Shimov and others.

Analysis of foreign and domestic publications enables us to conclude that the use of traditional methods of accounting and analysis of the effectiveness of entrepreneurial activity does not allow obtaining reliable data on the actual business processes of enterprise modernization. The existing accounting and reporting system is mainly focused on the reflection of aggregated data on the valuation of assets, capital, liabilities, revenue and expenses of business entities. From the information contained in the standard forms of financial reporting, which is standardized in accordance with the established requirements, no conclusions can be drawn regarding the conditions, sizes and sources of financing for enterprise modernization, nor about the economic efficiency of its implementation, nor about the profitability of products manufactured on the modernized equipment, nor about the money flows that accompanied modernization. It can be stated that at present, the considerable potential that is laid down in accounting and reporting, as the most important information management system, is vaguely used.

The relevance of the research is determined by the need to solve a whole range of interrelated problems of theory, procedure, methods and organization of accounting, reporting and analysis of the results of enterprise modernization in the context of harmonization of national legislation with IFRS and best practices. To solve these problems, further development of the existing accounting and reporting system is required, which determined the purpose of the research: theoretical and methodological objectivation and improvement of accounting, reporting and analysis of business processes, associated with enterprise modernization. This goal can be achieved by solving the following tasks:

- to justify the feasibility of considering enterprise modernization as a special object of accounting and analysis within the concept of maintaining physical and financial capital;
- to develop methods of the formation of a special subsystem of accounting and reporting on the process and financial and economic results of the effectiveness of enterprise modernization;
- to develop methods for identifying and analyzing hidden correspondences between modernization facilities and their financing sources.

The research object is the influence of the processes of enterprise modernization on a unified system of accounting, financial reporting and economic analysis. The choice of the research object is determined by the relevance of the formation of a single information system about the results of business processes at all stages of the life cycle of enterprise modernization in a single system of accounting and reporting, their insufficient development and practical significance in modern conditions.

The research is based on the study of scientific literature and the application of theoretical methods of comparative analysis, critical assessment, systematization and generalization.

Theoretical background for the reflection of production modernization in the accounting and reporting of business processes

Evaluation of the effectiveness of enterprise modernization is the most essential step in deciding on the feasibility of implementing an investment project. The time scales of the return on invested capital, its profitability, and the pace of development of the enterprise depend on how objective and comprehensive the analysis is. Qualitative analysis is impossible without reliable and complete information about the availability, structure and dynamics of resources involved in business processes due to enterprise modernization. In the process of economic activity, information flows are formed that characterize the main economic parameters of the enterprise: the composition and size of assets, equity, liabilities, revenue and expenses of the enterprise. Accounting fulfills the task of organizing these information flows and presenting data in the form of final reports. Although modernization is the most important aspect of any enterprise activity, it has not been considered as a special object of accounting and analysis since the present. The traditional system of accounting and analysis does not allow to sufficiently and comprehensively disclose the totality of causal relationships due to enterprise modernization. The financial reporting, as the main information base for managing enterprise modernization, is mainly focused on the reflection of aggregated data on assets, capital, liabilities, revenue and expenses of business entities. One of the main shortcomings of the modern analysis of economic activity is its fragmentation and lack of methods to assess the continuous process of funds movement.

To eliminate these shortcomings, it seems appropriate to highlight enterprise modernization as an independent object of accounting and economic analysis with its system of accounts and valuation of those assets that are the direct subject of modernization, as well as the revenue and expenses that are generated at the enterprise in the course of using the modernized facilities.

The research of the economic essence of the concept "enterprise modernization" made it possible to state that in the process of modernization the useful properties of modernized facilities are improved, i.e. the productivity of equipment and workload increases, the quality increases and the cost of production decreases, thereby directly affecting the capital and the amount of profit received at the enterprise.

Measuring the effectiveness of enterprise modernization infers the introduction of a criterion of economic efficiency. For the owners of the organization, as well as for the users of financial reporting, the dynamics of changes in such indicators as invested capital and profit are important. Therefore, at the enterprise level, the maximization of profits and the preservation of initially invested capital can serve as a form of a single criterion for the effectiveness of its activities.

A large number of scientific works is devoted to the study of the mechanisms for maintaining the enterprise capital. J. R. Hicks (1946) was one of the first researchers who talked about the importance of establishing the correct criteria for assessing the enterprise effectiveness in terms of revenue and expenses, and the final financial results. "The purpose of calculating revenue in practical matters is to give people an idea of how much they can spend without impoverishing themselves. According to this idea, we must define a person's income as the maximum value that he can consume during the week, remaining at the end of the week as wealthy as at the beginning" (J. R. Hicks). Thus, it is necessary not only to determine the amount of revenue received by the enterprise in the reporting period, but also to determine the amounts and means that can be used in the future to maintain and build up business activity.

In connection with the transition to international financial reporting standards, the interest in applying certain provisions in practice has recently increased. One of the key theoretical elements underlying the accounting methodology, which is defined by IFRS, is the so-called concept of capital. Their idea is to identify possible interpretations of the enterprise profit and its capital, based on the economic concept of creating accounting information.

In IFRS, when determining the interpretations of an enterprise profit, they are based on concepts of capital. The principles of preparation and development financial reporting allow enterprises to choose one of the two concepts of capital maintenance as the basis of the accounting methodology - financial or physical:

– maintaining financial capital means that during the reporting period, profit is declared to be earned only if the value of net assets at the end of the period exceeds the value of net assets at the beginning of the period after transfers to owners;
– maintenance of physical capital means that during the reporting period, profit is declared to be earned when the physical productivity (or operational ability) of the company at the end of the reporting period exceeds physical productivity at the beginning of the reporting period after deducting all owners' contributions and distributions between them during the reporting period.

The concept of maintaining capital gives a possibility to make the distinction between the company return on invested capital and the maintenance of capital. This way, profit (return on invested capital) is understood only as an increase in the value of assets that exceed the amounts necessary to maintain capital.

In practice, the concept of maintaining financial capital is most widely used, as it is more universal and is not tied to specific types of physical assets of the enterprise.

The concept of physical capital maintenance is determined by the appropriateness of maintaining and developing the production capacity of an enterprise, which is expressed in a certain output of a natural quantity of products. From this point of view, the generation of a net cash flow of assets is determined by the multiplication of production capacity in units of output by the amount of profit per unit of output.

Since in the process of modernization, the useful properties of the modernized objects are improved, i.e. the productivity of equipment and labor service increases, the quality increases and the cost of production decreases, then it directly affects capital. Within the physical concept, the modernization impact on the capital is to increase the productivity of the equipment, and within the financial concept it is the maximization of profit. Therefore, it is offered to consider the enterprise modernization as one of the ways to ensure the practical implementation of the concepts of maintaining financial and physical capital, and as a general criterion for the effectiveness of the enterprise.

Considering the above, the life cycle of production modernization should not be limited only to business processes to improve the useful properties of objects. The life cycle of production modernization should also include both business processes for the further use of modernized facilities in entrepreneurial activity, and business processes for generating revenue from the use of these facilities and it should consist of the following stages: 1) developing sources for modernization financing; 2) transformation of resources and improvement of useful properties of modernized objects; 3) the use of modernized facilities in business to generate revenue.

Thus, it is advised to monitor all business processes associated with modernization throughout the entire cycle of capital circulation.

Summing up, we regard it appropriate to consider modernization as a separate accounting object with the need to highlight its inherent accounting records and valuation of those assets that are the direct subject of modernization, as well as the revenue and expenses that are generated at the enterprise in the course of using the modernized facilities. To create a special information subsystem of accounting for production modernization, it is offered to use the basic algorithm: 1) The project and a set of special organizational, technical, financial and economic measures for the production modernization. 2) Development of criteria for the recognition of business transactions related to the production modernization. 3) The system of primary documentation of business operations related to the production modernization. 4) Development of a system of analytical indicative accounts to reflect business processes and business operations due to the production modernization. 5) Development of a standard system of accounts in the form of correspondence of indicative accounts in the framework of a single closed cycle of capital circulation, due to the production modernization. 6) Development of an analytical reporting system on the progress and results of the production modernization.

This idea will be as a prerequisite for the development of a special system of accounts, accounting methods and indicators of financial and management reporting, which will allow the formation of databases that reflect the impact of modernization on the valuation of all major accounting objects and indicators of financial reporting in the framework of the capital circulation. The analysis of such databases, as well as their quantitative and qualitative assessment, will allow making timely and well-grounded management decisions to ensure the effectiveness of enterprise modernization in the interests of the owner, investors and the government.

Methods of the formation of a special subsystem of accounting and reporting on the process and financial and economic results of the effectiveness of enterprise modernization

Management of modernization processes at the enterprise is impossible without unreliable information on the availability of sources of financing and objects of modernization. Qualitative, objective analysis, which provides a reliable result, can be built only on the basis of documented source data.

The national standard of accounting and reporting "Individual financial reporting" defines the following standard composition of financial reporting forms: Balance sheet reporting (mode №1); Profit and loss reporting (mode №2); Reporting on changes in equity (mode №3); Cash flow reporting (mode №4); Target financing reporting (mode №5). The current accounting and reporting system reflects generalized data on the valuation of assets, capital, liabilities, revenue and expenses of business entities. The use of traditional accounting methods does not make it possible to generate reliable information in the context of real-life business processes and types of activities of business entities. Analyzing the indicators contained in the financial statements, no conclusions can be drawn: regarding the volume of financing enterprise modernization; about the target use of resources allocated for and aimed at enterprise modernization; about the economic efficiency of enterprise modernization; about the profitability of products manufactured on modernized equipment; etc.

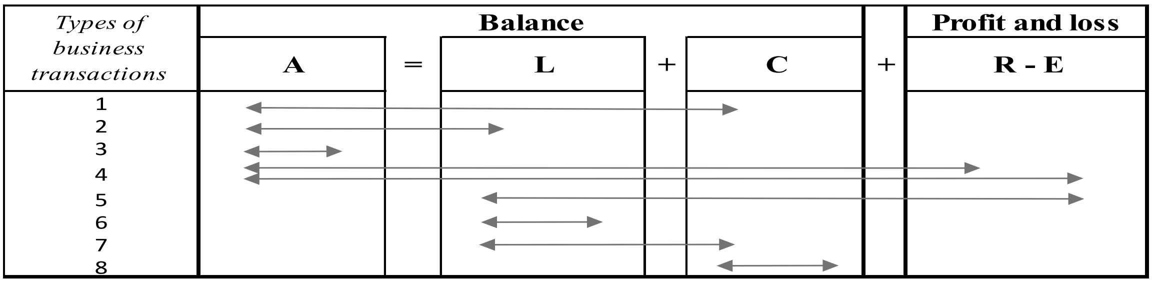
As a result, that considerable potential which is put in accounting and reporting, as in the most important information management system, remains to be vaguely involved, that finally reduces the demand for accounting and analytical functions in the system of making management decisions.

To solve this problem, there are methods of the formation of a special subsystem of accounting and reporting on the process and financial and economic results of the effectiveness of enterprise modernization. The basis of these methods is the principle of sequential sampling and grouping in the form of information tracks of accounting data by assets, liabilities, capital, revenue and expenses under the influence of business operations due to enterprise modernization as part of a closed accounting and analytical cycle of capital circulation.

The practical development of the methods is implemented on the basis of: 1) A systematic view of the complex of financial and economic relations of an enterprise between owners, managers, suppliers, buyers, the government and creditors; 2) The capital cycle of a typical industrial enterprise; 3) Accounting equality, reflecting the five main groups of economic indicators of a typical enterprise; 4) Classification of the main qualitative features, which allow identifying the business operations of business entities related to enterprise modernization; 5) Separation from the general stream of accounting data of those information tracks which describe the procedure for financing the enterprise modernization in terms of financing sources (equity and borrowed capital), objects of investment, the moments of its distribution by stages of the circuit and the assessment of the final financial results of the activities of enterprise modernization.

The whole set of numerous business transactions can be grouped in the context of 8 interdependencies of elements of accounting equalities (see Fig 1).

The methods imply the formation of analytical data based on the following typology of operations due to enterprise modernization: The 1st type of business transactions reflects the interaction of assets and capital of the enterprise (for example, the formation of the authorized capital by the owner in the form of cash). The 2nd type of transactions reflects the use of borrowed capital by the enterprise (the formation of assets through external borrowing and their repayment). The 3rd type reflects the redistribution of enterprise funds within assets at the stages of the capital circulation (transfer of raw materials to production, receipt of end products from a factory to a warehouse, etc.). The 4th type of transactions is associated with the sale of finished products, goods, works and services and a write-off of consumed assets for expenses of the reporting period. The 5th type reflects the formation of expenses due to accrued liabilities (indirect taxes). The 6th type is associated with the redistribution and restructuring of the obligations of the enterprise (re-lending, etc.). The 7th type reflects transactions involving the accounts of liabilities and equity (for example - accrual of dividends). The 8th type shows the reflection of operations within equity (reservation of net profit, replenishment of the authorized capital at the expense of profit).



Source: in-house development

Fig. 1. **Types of interdependencies of elements of accounting equality**

The purpose of this typologization is the formation of an accounting and analytical information model of enterprise modernization in the usual format of the balance sheet, revenue reporting, cash flow reporting. The model is formed by means of a special sample from the general information flow of accounting and grouping information tracks (business transactions) into separate data arrays due to enterprise modernization (marked with letter “M”). This approach does not violate the information flow of the formation of accounting and reporting data of the enterprise and provides a methodological unity in assets valuation, liabilities, capital, revenue and expenses of the enterprise both in the context of its general economic activity as a whole, and in the form of business processes inquiry related to modernization in particular. As a result of the developed methods, sub-reporting forms are formed (sub-balance sheet, sub-statement of profit and loss, sub-statement of cash flows) within the framework of a unified methodology for generating typical enterprise reporting with a system-based reflection of the processes and results of enterprise modernization carried out at the enterprise for the reporting period (profit and loss reporting) and at the reporting date (balance sheet). This reporting contains a number of new economic indicators that have not been previously reflected on a systematic basis in accounting and reporting. The most significant indicators include revenue from sales of goods resulting from enterprise modernization, depreciation of modernized fixed assets, modernized fixed assets themselves, profit (loss) from enterprise modernization, modernization expenses, etc. These indicators are interrelated both with the general information flow, comprehensively reflecting the activities of the enterprise, and with the results of the enterprise in the field of production modernization. This methodological approach allows getting financial reporting (balance-sheet) of the enterprise, which fully and comprehensively reveals the processes of modernization that have been implemented at the enterprise and reflects its consequences of influence on the financial results (profit or loss), assets, liabilities, capital. The reporting obtained in this way will serve as an information base for calculating the performance indicators of enterprise modernization as part of the implementation of the concept of maintaining the financial and physical condition of capital.

Thus, the prerequisites and the basic algorithm for creating a special information subsystem of accounting for production modernization will be as follows: a project and a set of special organizational, technical, financial and economic measures for production modernization; development of criteria for the recognition of business transactions related to production modernization; the system of primary documentation of business operations related to production modernization; development of a system of analytical indicative accounts to reflect business processes and business operations due to production modernization; development of a standard system of accounts in the form of correspondence indicative accounts in the framework of a single closed cycle of capital circulation due to production modernization; development of a system of analytical reporting on the progress and results of production modernization.

The methods of reflection in accounting of hidden correspondences between modernization objects and sources of their financing

The methods of domestic accounting reflect the information on the generation of the volume of financing sources for modernization in separate accounts. However, the degree of analyticity and completeness of such information is insufficient to justify effective management decisions. Currently, the used accounts do not consider the investment resources themselves, but obligations on them. This leads to the lack of data on the size of the generated and used financing sources for the enterprise modernization and their intended use.

Two main levels of information hierarchies in the framework of accounting are usually distinguished - the level of analytical accounting and the level of synthetic accounting. The current practice of accounting does not allow us to establish the correspondence of specific financing sources of production modernization and investments into specific types of assets, as well as tracking the movement of value through the stages of the capital circulation. The correspondence between the accounting objects (for example, a loan received from a bank and monetary assets) which is recorded upon completion of business operations is static in nature, that does not allow tracking, for example, loan security as funds are used at the stages of the circuit (purchase of raw materials, equipment, etc.). Such a gap between the moment of recognition of obligations and their provision with assets, their subsequent movement within the framework of business processes, makes it impossible to track the target use and effectiveness of loan coverage. In this regard, there are methods for dynamic accounting analysis of the correspondence between assets, liabilities, capital, revenue and expenses as the implementation of business processes. This way, it seems appropriate to implement analytical accounting, within a separate information subsystem, by creating additional entries to reveal hidden correspondences between accounting objects (assets, liabilities, capital, revenue and expenses).

The algorithm for generating additional entries to identify hidden correspondences between accounting objects (assets, liabilities, capital, revenue and expenses) is based on the following logical reasoning. The modern system of processing economic information in the framework of accounting is presented in the fig. 2.

1. The book of business transactions

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2. Calculation of credit turnover and defining account balance

↓

3. Completion of the general ledger

↓

4. Compilation of the turnover balance sheet

↓

5. Compilation of the balance sheet

Source: in-house development

Fig.2. **The modern system of processing economic information in the framework of accounting**

From the diagram in Figure 3 we see that first all business transactions are recorded in "The book of business transactions" on the basis of primary documents (stage 1). Then all this information is allocated to accounts, i.e. debit and credit turnover and closing balances are calculated (stage 2). Then, the data is transferred from the accounts to the general ledger (stage 3) and a turnover balance sheet is compiled on its basis (stage 4), which serves to verify the correctness of the allocation of amounts to the accounts. Then, the balance sheet and other forms of financial statements are compiled (stage 5). Fig 3 presents a simplified form of the balance sheet.

Assets	**Sources (capital, liabilities)**
Asset1	Source1
Asset2	Source2
AssetN	Source N
Balance sheet total	Balance sheet total

Source: in-house development

Fig. 3. **A simplified form of the balance sheet**

We modify the form of the balance sheet by conducting two groups of its items: the 1st — assets by financing sources; the 2nd — sources by their assets provision, as follows, as shown in Figures 4 and 5. If we take a separate item from the modified forms of the balance sheet, we'll get the correspondence of a specific type of asset and its financing source and vice versa - a specific type of source, secured by an asset (Fig. 6,7)

Assets	Sources (capital, liabilities)	Balance sheet total
Asset1	Asset1	Balance sheet total
Asset 2	Asset2	Balance sheet total
Asset N	AssetN	Balance sheet total
Total:		**Common balance sheet total**

Source: in-house development

Fig. 4. **A modified form of the balance sheet with a grouping of asset items by sources of financing**

Source (capital, liabilities)	Assets	Balance sheet total
Asset 1	Asset 1	Balance sheet total
Asset2	Asset 2	Balance sheet total
Asset N	Asset N	Balance sheet total
Total:		**Common balance sheet total**

Source: in-house development

Fig. 5. **A modified form of the balance sheet with a grouping of items by sources in the context of their assets provision**

Asset	Source	Balance sheet total

Source: in-house development

Fig. 6. **An item of a modified form of the balance sheet reflecting the correspondence of a particular type of asset and its source of origin**

Source	Asset	Balance sheet total

Source: in-house development

Fig. 7. **An item of a modified form of the balance sheet reflecting the correspondence of a particular type of source secured by assets**

It would seem that these are correspondences between accounting objects (assets and sources). But taking into account the fact that from the moment when a business transaction is completed to its entering the balance sheet, there are many technical procedures for processing information, and those correspondences that may be there - are not factually correct. Moreover, the existing accounting methodology will isolate the assets movement without linking them to the financing sources and vice versa. It also does not solve the problem of identifying correspondences between accounting objects (assets and sources).

To solve this problem, it is offered to allocate a separate group of analytical accounts, which can be figuratively called compliance accounts. The basis for the formation of a compliance account will be items from a modified form of the balance sheet (Fig. 6,7). A characteristic feature of the encoding of this account is that it always consists of two parts. One shows its relation to the asset, and the other one shows its relation to the source of its asset (Fig. 8,9).

Asset/ source (capital, liabilities)

Debet	Credit

Source: in-house development

Fig. 8. **Active account scheme by source of funding**

SOURCE (CAPITAL, LIABILITIES) /asset

Debet	Credit

Source: in-house development

Fig. 9. **Passive account scheme by asset**

We also finally modify the balance sheet form where hidden correspondences between accounting objects will be reflected. By analogy with accounts, let name it a compliance balance.

Balance sheet assets			**Balance sheet sources (capital, liabilities)**		
Asset	**Sourceи**	**Amount**	**Source**	**Asset**	**Amount**
Asset1	Source1	Amount	Source1	Asset1	Amount
Asset2	Source2	Amount	Source2	Asset2	Amount
AssetN	SourceN	Amount	SourceN	AssetN	Amount
Total:		**Balance sheet total**	**Total:**		**Balance sheet total**

Source: in-house development

Fig. 10. **The compliance balance form**

The need for additional entries to identify hidden correspondences as a separate information subsystem of management accounting is caused by the necessity of tracking information flows between specific assets and their sources involved in the course of enterprise modernization. This approach allows you to get a complete picture of the consequences that modernization has on the financial statements. It is offered to apply the following algorithm: 1st stage: grouping of accounting information in the framework of accounting equality; 2nd stage: classification of business operations in terms of their impact on the balance sheet. 3rd stage: definition of correspondence between separate asset and liability accounts of the balance sheet and revenue statement.

As an example, we will analyze the distinctive features of the use of compliance accounts in comparison with existing ones. To illustrate the above, let us deal with a typical situation when an enterprise takes credit funds, buys equipment, places it in operation, and partially repays the loan. To explain it clearly, we will use a simplified encoding of accounts instead of the established one (**C** - cash, **L** - bank loan, **AP** - accounts payable, **E** – equipment, **EC** – equity capital). The block of business operations which illustrate this situation is presented in table 1.

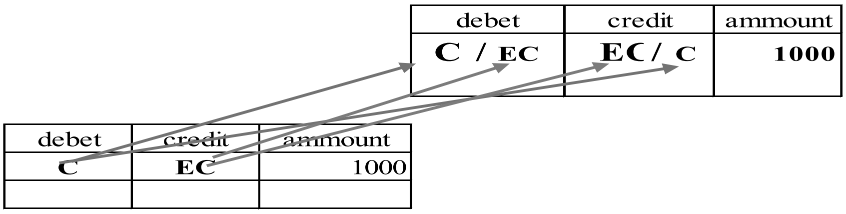
Table 1

Business situation

№	Contents Of A Business Transaction	Debet	Credit	Amount
1	Registered capital is formed	C	EC	1000
2	A loan is received to the current account	C	L	800
3	Equipment is received from a supplier	E	AP	1200
4	The payment is made from the current account by means of the loan	AP	C	500

Source: in-house development

Hidden correspondences are formed when economic resources come to enterprises. At this moment, the intended purpose of the resource and the source of its origin are established, i.e. the asset account and the account of the financing source are determined. The first three business operations are of this very type. Accounting of hidden correspondences is reflected in compliance accounts as follows: the account of analytical data sheet "L" is opened to the account "C", and it is presented as C/EC. In the same way, together with the account “EC” the account of analytical data sheet “C” is opened and has the form EC/C (Fig. 11)



Source: in-house development

Fig. 11. **Formation of compliance accounts**

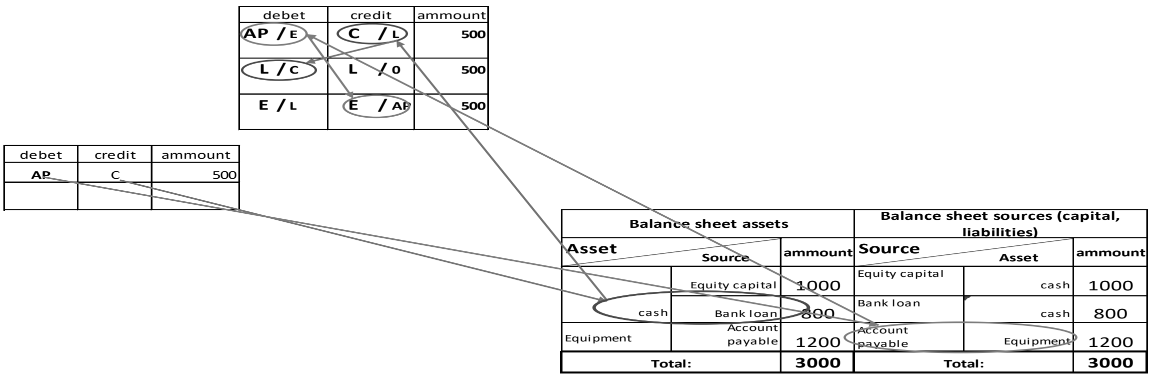
For the second and the third business transactions, hidden correspondences will be reflected in the same way. Figure 12 schematically shows the compliance balance after the first three business transactions from table 1. It clearly shows the correlation between the assets and the sources of their financing.

Balance sheet assets			Balance sheet sources (capital, liabilities)		
Asset	Sourceи	Amount	Source	Asset	Amount
cash	Equity capital	1000	Equity capital	cash	1000
	Bank loan	800	Bank loan	cash	800
Equipment	Account payable	1200	Account payable	Equipment	1200
Total:		**3000**	Total:		**3000**

Source: in-house development

Fig.12. **The compliance balance after the first three business transactions from table 1**

Then, economic resources are joined with the general circulation of capital, where their purpose and source of financing can change. This type will include the 4th business transactions from table 1. The fourth business transaction reflects the transfer of funds by the enterprise to the equipment supplier. The use of compliance accounts allows to determine the source of funds (C/l – credit funds) and what they spent on (AP/e - equipment). Besides, this business transaction affects both the structure of assets and the structure of sources of their coverage. The source of funds was a bank loan, therefore, when writing off funds, the loan coverage should also change. But such operations are not reflected in the current system of accounts. When using compliance accounts, an additional accounting entry is formed, which reveals the hidden correspondence of the financing source and its coverage. Instead of money, the loan was secured by equipment, which will be reflected in the entity (debet L/c – credit L/e, Fig. 13). After the company paid credit money to the equipment supplier, the paid part of accounts payable, which acts as a source of financing equipment, was replaced by bank accounts payable. This hidden correspondence is also reflected by the additional entity (debet E/l - credit E/ap, Fig. 13).



Source: in-house development

Fig. 13. **The formation of additional entities in the system of compliance accounts.**

According to the compliance balance (Fig. 14), it can be seen that the equipment is already financed from two sources - a bank loan and short-term account payable. On the other hand, the bank loan is covered by two assets - funds and equipment. Using compliance accounts enables us to track those correspondences between assets and sources of their financial coverage which are hidden and not obvious when using the standard system of accounts. Thus, it gives a possibility to obtain new data that cannot be obtained when using a standard system of accounts. The above-discussed approach illustrates the possibility to synchronize the sequence of business transactions with the reflection of their impact on the financial statements through the accounting system as for the circulation of capital as a whole, and for each separate stage of the cost movement in the process of doing business.

Balance sheet assets			Balance sheet sources (capital, liabilities)		
Asset	Sourceи	Amount	Source	Asset	Amount
cash	Equity capital	1000	Equity capital	cash	1000
	Bank loan	300	Bank loan	cash	300
Equipment	Bank loan	500		Equipment	500
	Account payable	700	Account payable	Equipment	700
Total:		2500	Total:		2500

Source: in-house development

Fig. 14. **The compliance balance after all the business transactions from table 1**

Conclusions, Proposals, Recommendations

The results of this research made it possible to prove the feasibility of considering modernization as a separate accounting object with the need to highlight its inherent accounting records and cost estimation of those assets that are the direct subject of modernization, as well as the revenue and expenses that are generated at the enterprise in the course of using the modernized facilities.

Based on the research, a special subsystem of management and financial accounting was developed, which reflects the processes and final results of enterprise modernization. The basis of this technique is the proposed accounting and analytical model for restructuring a single information flow in the context of business processes due to enterprise modernization. The criteria are developed according to which the information tracks can be attributed to business processes of enterprise modernization. Special information media is also developed which is a form of separate analytical accounts and a system of their correspondence, which allows to provide a quantitative and qualitative cost estimate of the target use of financial resources, through which the enterprise is modernized on the basis of a synthesis of data in special management reporting.

The necessity was justified for accounting and reflection of hidden correspondences in management and financial reporting between modernization facilities and their financing sources. In this regard, a system of special compliance accounts has been developed that is designed to identify objectively existing hidden correspondences that arise between equity capital and a bank loan aimed at enterprise modernization and the corresponding modernizable assets that generate revenue, expenses and financial results. The developed management and financial statements will contain a much larger amount of information on the basis of which it will be possible to give an objective assessment of both the modernization process itself and its final financial results. This approach gives a possibility to conduct a comprehensive analysis of the effectiveness and quality of modernization carried out at the enterprise, taking into account the target use of allocated financial resources.

Bibliography

Act of the Council of Ministers of the Republic of Belarus “On the state program of innovative development of the Republic of Belarus for 2011 - 2015” [*O gosudarstvennoy programme innovatsionnogo razvitiya Respubliki Belarus' na 2011 – 2015 gody*] No. 669 of May 26, 2011 (as amended by the Resolution of the Council of Ministers of the Republic of Belarus of February 4, 2012 No. 117) (in Russian);

Alexander, D., Britton, A., Jorissen, E., 2005. International financial reporting standards: from theory to practice - M.: Vershina.

Altukhova, Y.V., 2010. Accounting and analytical support for the sustainable development of agricultural enterprises [*Uchetno-analiticheskoye obespecheniye upravleniya ustoychivym razvitiyem sel'skokhozyaystvennykh predpriyatiy*] / Y. V. Altukhova, V. G. Shirobokov. - Voronezh: Sources, 221 p. (in Russian)

Berdnikova, T.B., 2011. Analysis and diagnostics of financial and economic activities of the enterprise [*Analiz i diagnostika finansovo-khozyaystvennoy deyatel'nosti predpriyatiy*]: Tutorial / T.B. Berdnikova. - M.: INFRA-M, 215 p.

Bernard, I., Collie, J.K., 1994. Translation from French - M.: International Relations, B. II. – 720 p.

Bernard, I., 1996. Explanatory economic and financial dictionary. French, Russian, English, German, Spanish terminology: 2 books

Betge, J., 2000. Balance Management / J. Betge; translated from German; edited by V.D. Novodvorsky. - M.: Accounting [*Bukhgalterskiy uchet*], -454 p.

Endovitsky, D.A., 2001. Comprehensive analysis and control of investment activities. Methodology and practice [*Kompleksnyy analiz i kontrol' investitsionnoy deyatel'nosti. Metodika i praktika*] / D.A. Yendovitsky; edited by L.T. Gilyarovskaya. - M.: Finance and Statistics, 399. (in Russian)

Ermolovich, L.L., 2006. Analysis of economic activity of the enterprise [*Analiz khozyaystvennoy deyatel'nosti predpriyatiya*]: tutorial / L.L. Ermolovich and others; edited by L.L. Ermolovich. - Minsk: *Sovremennaya shkola*, 736 p.

Hendricksen, E.S., Van Breda, M.F., Hendrickson, E.S., 2000. Theory of accounting: textbook. : translated from from English / - M.: Finance and statistics, 574 p.

International Standard for Financial Reporting (IAS) 16 "Fixed Assets" [Electronic Resource] // Center for Primary Education IFRS. - Access mode: http://allmsfo.ru/images/stories/Downloads/msfo/IAS/ias16.pdf.

Kondrakov, N.P., 2014. Accounting [*Bukhgalterskiy uchet*]: Tutorial / N.P. Kondrakov. – 4th ed., Revised and added - M.: SIC INFRA-M, 681 p.

Kuter, M.I. 2016. Theory of accounting [*Teoriya bukhgalterskogo ucheta*]: tutorial for students of higher education of the specialty "Accounting, analysis and audit" / M. I. Kuter, D. A. Pankou, S. G. Vegera , S. G. Korotaev, E. N. Rybak, M. M. Gurskaya; under the general edition of M.I. Kuter. - Minsk: Novoye znaniye, 678 p.

Ladutko, N.I., 20003. Accounting for non-accounting specialties: tutorial / N.I. Ladutko, P.E. Borisevsky, E.N. Ladutko; edited by N.I. Ladutko. - Minsk: *Knizhnyy dom*, 576 p.

Makarieva, V.I., 2014. Analysis of financial and economic activities of the organization [*Analiz finansovo-khozyaystvennoy deyatel'nosti organizatsii*] / V.I. Makaryeva, L.V. Andreeva. - M.: Finance and Statistics, 304 p.

Melnikas, B., Jakubavičius, A., Vilis, M., Leichteris, E., Bogatyreva, V., Sakalaite, G., Kauneliene, V., Sutkus, A., Bogdan, N., Pelekh, S., Uspensky, A., Kuzmin, V., 2013. Economics of knowledge: internationalization and taxonomy of innovation. Vilnius: Lithuanian Innovation Center, 704 p. (in Russian)

Paly, V.F., 2006. Management accounting of costs and revenues (with elements of financial accounting) / V.F. Paly. - M.: INFRA-M, 279 p.

Pankou, D.A., Matsiush, I.V., 2015. Information models of the accounting analysis of the effectiveness of enterprise modernization/ Development of Accounting Accounting Concept on the Basis of Institutional Approaches and Benchmarking: Monography. Vinnytsya: VFEU, pp. 167 – 224 (in Russian/ in Ukranian)

Protasenya, V.S. (2013). Modernization of industrial production - a condition for innovative development of the economy: organizational aspect // BSEU (*ekonomika*/ economics) (in Russian);

Pyatov, M.L., Smirnova, I.A. 2008. Conceptual foundations of international financial reporting standards [*Kontseptual'nyye osnovy mezhdunarodnykh standartov finansovoy otchetnosti*] - M.: 1C-Publishing (in Russian)

Richard, J., 2000. Accounting: Theory and Practice: translated from French /J. Rishard; edited by Y. V. Sokolov. - M.: Finance and statistics, 158 p.

Savitskaya, G.V., 2017. Analysis of economic activity of the enterprise: tutorial / G.V. Savitskaya. – 6th edition, Revised and added - M.: INFRA-M, 378 p.

Sheremet, A.D., 2015. Methods of financial analysis [*Metodika finansovogo analiza*] / A.D. Sheremet, R.S. Sayfulin. - M.: INFRA-M, 176 p.

Shevlyukov, A.P., 2009. Paradigms of the Russian model of capital accountancy [*Paradigmy russkoy modeli schetovodstva kapital'nogo imushchestva*] / A.P. Shevlyukov. - Gomel: Belarus. Trade and econ. University of consuming and cooperation, 139 p.

Shimov, V.N. Kryukov, L.M., 3013. Sociology: Scientific and Theoretical Journal / Belarusian State University *Sotsiologiya: nauchno-teoreticheskiy zhurnal*]. No. 3.

Strazhev, V.I., 2008. Analysis of economic activity in industry [*Analiz khozyaystvennoy deyatel'nosti v promyshlennosti*] / V.I. Strazhev and others; edited by V.I. Strazhev, L.A. Bogdanovskaya. – 7th ed., revised - Minsk: Ab. school, 527.

The concept of Integrated Modernization of Belarus // [Online] – Access mode: www.ekonomika.by – Access date: 09.05.2015;

Vasilieva, L.S., 2017. Financial analysis [*Finansovyy analiz*] / L.S. Vasiliev, M.V. Petrovskaya. - M.: KnoRus, 880 p.