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# Credit System in Categorical-Systemic Representation

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## ABSTRACT

**The subject** of the research is the credit system. **The objective** is to develop a model of the object and, on its basis, formulate a definition of the credit system. It is hypothesized that using the methods of formal logic, categorical-system methodology and the theory of dynamic information systems will allow us to obtain a scientifically sound and logically correct definition of the desired concept. **The methods** of critical analysis of literature, logical definition of the concept, triadic decoding of the category and generalization are used. A necessary and sufficient condition for classifying objects as credit systems was determined. These conditions included being a subsystem of the economy and possessing specific resources with the qualities of repayment, urgency, and payment. A model of the credit system is developed based on the principles of formal logic, and it is a subsystem of the economy. Using the ideas of triadicity, a model of the credit system was developed that reflects its functions, such as accumulation, redistribution, multiplication and their varieties. A detailed definition of the credit system is formulated – it is a subsystem of the economy that has specific resources characterized by the properties of repayment, urgency and payment and performs the functions of accumulation (preserving, saving, accumulating), redistribution (transfer, transfer, assignment) and multiplication (reserve, deposit, trust). It is **concluded** that the developed models of the credit system reflect its natural essence, fundamental differences from other forms of economic systems and provide a systemic understanding of the object; most fully and accurately reflect the meaning of the name, the phenomenon under study, and also serve as a basis for constructing a detailed definition of the concept. The obtained results contribute to the development of the scientific theory of credit and the credit system. The practical value lies in the fact that the obtained results contribute to a more precise understanding of the nature of the credit system and assist in the formation of a more adequate theoretical platform for developing a program for the development of the domestic credit system. A program for the development of the credit system with a reliable theoretical basis will be more effective both at the macro level and at the level of credit institutions.

**Keywords:** credit system; definition; definition; resources; economic subsystem; formal logical method; method of triadic category decoding

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## INTRODUCTION

Many aspects of credit system theory do not get sufficient focus on yet. The nature of the credit system remains under-researched, including the patterns of its formation and development, the functions it performs within the economic system, the interconnections of its elements, their interactions, principles of self-regulation, and much more. Unresolved issues also include questions regarding the determination of the fundamental properties of the credit system, as well as the characteristics that allow it to be distinguished from similar, yet not identical, entities such as the monetary, financial, banking, and payment systems. One of the important tasks is to develop a scientifically grounded definition of the concept of the credit system that fully and accurately reflects its essence and nature. We assume that the application of formal logic methods, categorical-systems methodology, and the theory of dynamic information systems will allow us to obtain a scientifically grounded and logically correct definition of this concept.

## REVIEW OF THE LITERATURE

The analysis of scientific publications on the research topic has led to the conclusion that many Russian and foreign scholars set the task of defining economic categories and concepts. To address it, systematic, historical, institutional, functional, descriptive, and other scientific-methodological approaches are applied.

The development of the definition of the concept of “credit system” involved researchers such as G. M. Tarasova [1], A. I. Polishchuk [2], M. V. Bykov [3], O. I. Lavrushin [4], and others.

Overall, the review of existing definitions in the scientific literature indicates a large number and variety of interpretations of the credit system (*Table*). At the same time, the emphasis is primarily placed on its position within a higher-order system, but the fundamental specific characteristics that would

distinguish it from a number of similar, yet not identical, subsystems of the economy are not defined, which prevents an adequate scientific understanding of its nature and features.

The analysis of the *Table* revealed the following.

Some authors [5–9] define the credit system as a part (link, element, one of the structures) of the economic system. This is very logical from the perspective of a systems approach, as “usually any system being studied is an element of a higher-order system” [14]. However, the essential characteristic of the credit system is not highlighted in these definitions.

A. V. Bondarenko highlights in the definition of the credit system such a feature as its ability to provide the economy with financial resources [9]. At the same time, financial resources are indicated, but not credit ones. Another researcher, G. M. Tarasova, in her definition indicates that credit organizations facilitate the movement of loaned value [1]. On one hand, we agree with A. V. Bondarenko and G. M. Tarasova that the credit system serves the function of providing security. However, on the other hand, this function is performed by many other economic systems.

In the Great Russian Encyclopedia, the credit system is defined as “a collection of institutions that accumulate and provide temporarily free funds in accordance with the basic principles of lending”.<sup>1</sup> At the same time, the emphasis is placed on the institutional component of the credit system and its two functions (accumulation and redistribution), but other fundamental features that characterize the credit system are not reflected.

In the Financial and Credit Encyclopedia<sup>2</sup> and in the definition provided by E. F. Zhukov,<sup>3</sup>

<sup>1</sup> Great Russian Encyclopedia: In 30 Volumes. V. 15. Congo Baptism. Moscow: BRE; 2010:670.

<sup>2</sup> Financial and Credit Encyclopedic Dictionary. Moscow: Finance and Statistics; 2002:446.

<sup>3</sup> Zhukov E. F., ed. Money. Credit. Banks. Textbook. Moscow: UNITY-DANA; 2009: 249–251.

### Author's Definitions and Interpretations of the Credit System

Author, definition or interpretation of the credit system	Component
M.S. Atlas: "The credit system is one of the most important parts of modern market economy" [5]	Basic concepts used for its characterization: link, element, part, one of the structures
O.I. Lavrushin: "The credit system is part of the economic system along with the financial system, the trading system and other sectors of the economy" <sup>1</sup>	
A.I. Polishchuk: credit system – "Historically established element of economic national (global) system" [6]	
The Great Russian Encyclopedia: Credit system – "a part of the economic system, has its own functional, institutional, and organizational specifics" <sup>2</sup>	
L.M. Milovskaya: the credit system is "one of the most important and integral structures of a market economy" [7]	
N.S. Rossiina: the credit system is "a fundamental part of the country's economy" [8]	
A.V. Bondarenko: the credit system "is a central link in the process of forming the structure of the national economy, as it significantly provides the new economic structure with the necessary financial resources" [9]	The basic concepts used to characterize it: specific elements, credit relationships and credit institutions, forms and methods of lending, elements of the credit mechanism. The concept used to combine initial formations: a set.
The Great Russian Encyclopedia: "Credit system, a structured set of certain elements through which the essence and functions of credit are realized" <sup>3</sup>	
Financial and Credit Encyclopedia: Credit System – "a set of credit relationships and credit institutions that organize these relationships" <sup>4</sup>	
G.M. Tarasova: the credit system is "a set of credit relations arising in the process of the movement of loaned value, as well as credit organizations that facilitate this movement" [1]	
O.V. Koshko: the credit system is an "ordered set of elements of the credit mechanism capable of institutional activity and functional self-development" [10]	
T.Sh. Tinikashvili: the credit system is "a set of credit relations, forms, and methods of lending" [11]	
O.I. Lavrushin: the credit system is "a set of elements designed to implement the characteristics inherent to credit" <sup>5</sup> ; the credit system is "a combination of three blocks – the basic (covering fundamental concepts of credit), organizational, and regulatory" [4]	
E.F. Zhukov: the modern credit system is "a collection of various credit and financial institutions operating in the loan capital market and engaged in the accumulation and mobilization of monetary capital" <sup>6</sup>	

Table (continued)

Author, definition or interpretation of the credit system	Component
A.I. Polishchuk: the credit system is “open to global economic relations, possessing the principle of organization and a credit mechanism as a unified structure of aggregated elements of credit relations, capable of consolidating the reproductive credit potential of alternative users, creating means of payment, moving them through time and space, and ultimately influencing, firstly, economic growth and poverty alleviation, and secondly, maintaining liquidity and leveling the informational asymmetry between those in need of borrowed funds and those who have them” [12]	The concept that indicates the complexity of an educated system: a unified device, a whole, a special system of organization, a functional-institutional system, an organizational-functional form. Additions indicating its specific qualities: the ability to accumulate and mobilize capital, the ability to consolidate credit potential, the ability to create means of payment and move them through time and space, the ability to organize lending.
O.I. Lavrushin: the credit system – “as a whole includes credit itself, credit institutions, and the lending system” <sup>7</sup>	
V.M. Bykov: the credit system is a “functional-institutional system that includes a number of components, which in turn can be regarded as its elements” [3]	
A.I. Polishchuk: the credit system is “a special system for organizing its forms and mechanisms for regulating the supply and demand for credit, built on two principles – the ordering of debt relations and ensuring the repayment of borrowings by those who possess creditworthiness and credit potential” [13]	

Source: Compiled by the author.

<sup>1</sup> Lavrushin O.I., ed. Money. Credit. Banks. Textbook. Moscow: KNORUS; 2010: 348–355.

<sup>2</sup> Great Russian Encyclopedia: In 30 Volumes. V. 15. Congo Baptism. Moscow: BRE; 2010:670.

<sup>3</sup> Great Russian Encyclopedia: In 30 Volumes. V. 15. Congo Baptism. Moscow: BRE; 2010:670.

<sup>4</sup> Financial and Credit Encyclopedic Dictionary. Moscow: Finance and Statistics; 2002:446.

<sup>5</sup> Lavrushin O.I., ed. Money. Credit. Banks. Textbook. Moscow: KNORUS; 2010:348–349.

<sup>6</sup> Zhukov E.F., ed. Money. Credit. Banks. Textbook. Moscow: UNITY-DANA; 2009:249–251.

<sup>7</sup> Lavrushin O.I., ed. Banking: the modern credit system. Training manual. Moscow: KNORUS; 2005:11–14.

it is stated that credit institutions operating in the loan capital market accumulate and mobilize monetary capital. That is, they reflect two functions of the credit system – the accumulation and mobilization of monetary capital. However, there are other fundamental functions of the credit system that it performs in the economy. These definitions are not reflected in the data.

Thus, researchers highlight different functions of the credit system, but instead of focusing on credit resources; they emphasize monetary capital, loaned value, temporarily free funds, and so on. In our opinion, credit

resources are a broader phenomenon. They include not only temporarily available cash resources but also credit obligations created in the process of lending. Our analysis also showed that in the overwhelming majority of definitions of the credit system, the authors highlight credit relations, forms and methods of lending, or credit relations and credit organizations [1, 10, 11]. O.I. Lavrushin [4] defines the elemental composition of the credit system as follows: “the credit system consists of three blocks – the basic, organizational, and regulatory”. However, he believes that the understanding of the content

of each of these blocks has not been achieved to date.

In some definitions of the credit system [3, 12], its systemic nature and complexity are emphasized. Terms such as unified device, whole, special system of organization, functional-institutional system, organizational-institutional form are used.

There are also definitions in which authors highlight specific characteristics (qualities) of the credit system, such as: the ability to accumulate and mobilize capital,<sup>4</sup> the ability to consolidate credit potential, and the ability to create means of payment and move them through time and space [12, 13]. However, the order of their occurrence is not specified.

We consider it important to point out that in the scientific literature there are definitions in which authors highlight qualities (characteristics) of the credit system that are similar to those of other economic systems, for example, the financial system. According to L.M. Shevchenko, “the financial system can be viewed as a system for the accumulation of monetary resources” [15]. Yu. N. Vorob’ev and L. M. Borshch believe that the financial system “...ensures the distribution and redistribution of financial resources in favor of the state through a number of administration, regulation, and control functions” [16].

The analysis of foreign publications revealed the following. Researchers emphasize the importance of the credit system for the country’s economy [17]. However, it is not distinguished as a separate subsystem of the economy, but its functions are viewed through the lens of the financial system [18]. Thus, M. V. Bykov points out that the Western school generally ignores credit theory and incorporates the credit system into the financial system. He concludes that such an approach leads to confusion in the interpretation of the credit system.

Many Russian scholars also use the terms “financial and credit system”, “monetary and credit system” and “credit and banking system” in their papers [19–21]. They noted, on one hand, to emphasize the close interaction between the individual parts of the economic system, and on the other hand, to show and explain the unity of processes at the level of organization and regulation of monetary, credit, and financial relations, which allow for the greatest successes in economic development. However, this does not allow for a focus on studying credit and the credit system as independent phenomena, as well as addressing the fundamental problems of the corresponding scientific theory.

Thus, the wide variety of interpretations of the credit system that we have identified convinces us of the need to continue exploring its nature and to undertake the task of developing a definition of the relevant concept that reflects it sufficiently and accurately.

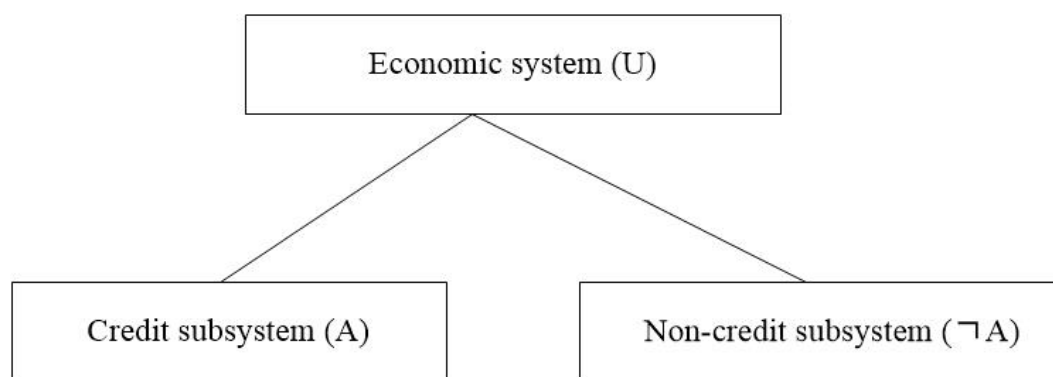
The analysis of scientific publications dedicated to the study of the credit system has shown that there is no agreed-upon scientific understanding of its nature, embodied in a corresponding definition. At the same time, this task is extremely important both for the formation of a scientifically grounded conceptual framework in this subject area and for establishing a reliable theoretical platform for managing the credit system in the interests of the overall development of the country’s economy.

The above-mentioned has defined the goal of this research — the development of a credit system model that reflects its nature, essence, and the construction of a definition of the relevant concept based on it.

## METHODS OF RESEARCH

The problem of defining the concept of economic phenomena, which allows for reflecting their nature and revealing their essence, is being addressed by authors of scientific works using various, quite productive, approaches, such as linguistic,

<sup>4</sup> Zhukov E.F., ed. Money. Credit. Banks. Textbook. Moscow: UNITY-DANA; 2009: 249–251.



**Fig. 1 Primary Model of the Credit System As Part of the Economic System**

Source: Compiled by the author.

historical, factual, genetic, and axiomatic. However, the limitations of traditional approaches to constructing definitions do not allow for a complete and accurate reflection of the content of the sought concept. This study was conducted using a fundamentally new categorical-systemic methodological approach to defining concepts with significant heuristic potential, developed by V.I. Razumov and G.D. Boush [22]. Russian scientists [23–25], using tools of categorical-system methodology and the theory of dynamic information systems today, reasonably believe that based on the special categorical scheme of the studied object developed with their help, it is possible to implement non-trivial methods for defining categories and obtain a scientifically grounded definition of the concept. Categorical schemes are used within this approach as tools that facilitate the comprehension, understanding, and description of any subject by highlighting the most important components of the object being studied, designating them with category names, and organizing the identified categories into a system according to specific principles. A fundamental aspect is the reference to the idea of triadicity, which has developed independently within the framework of the categorical-systematic methodology being developed by V.I. Razumov, and later in the theory of dynamic information systems, co-developed with V.P. Sizikov [26]. Triads as systems of

categories consisting of three units allow us to represent an object, highlight the necessary and sufficient number of its components that ensure the understanding of its essence and nature, as well as to logically and correctly explain and describe it. Categories in triads are arranged in a sequence that reflects the pattern of their emergence (formation) in the object [27].

Credit, as a “certain type of loans of money and goods characterized by return ability, term, and cost” [24], is a systemic object. A credit, as a whole, consists of parts (structural elements or components) that reflect its qualities. The qualities inherent in credit manifest externally as functions [28].

Credit is the fundamental basis of the credit system. First came credit, then its extension — the credit system with its qualities, structural elements, properties unique to it, resources, and carriers of its functions.

In this study, the first stage involves developing a definition of the credit system using the principles of formal logic. Then, in the second stage, using categorical-system methodology and the theory of dynamic information systems, a one-level model of triadic decryption of the credit system is developed. The definition of the credit system developed in the first stage is supplemented by qualitative characteristics (functions) inherent to it. Next, in the third stage, a two-level triadic decryption of the basic category is developed, and based on this; an expanded



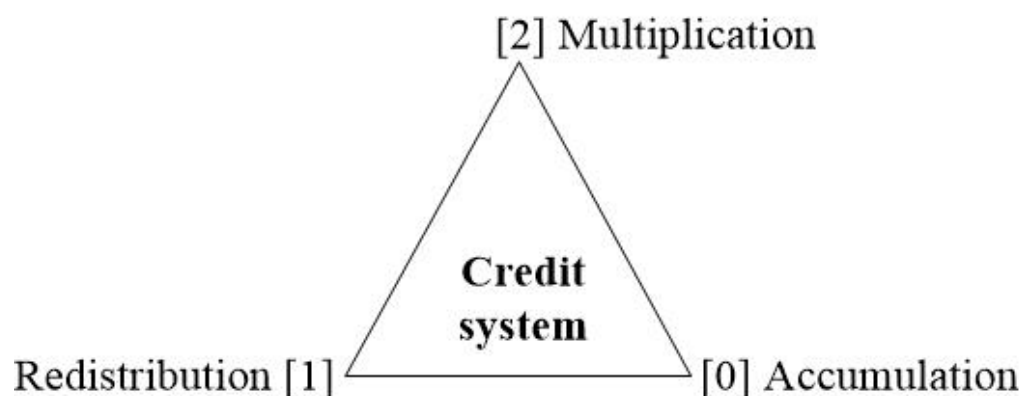


Fig. 2. Model of Single-Level Triadic Decryption of the Credit System

Source: Compiled by the author.

definition of the economic phenomenon “credit system” is formulated.

## RESULTS AND DISCUSSION

At the first stage, a definition of the concept of “credit system” was developed using a formal-logical method of defining concepts [22].

A review of scientific publications has shown that the credit system is a part (element, link, one of the structures) of the economy [6–9, 12]. From this position, it follows that the economy is the most general category for the concept of “credit system”; it is a large whole, a system that includes many subsystems, one of which is the credit subsystem.

It is fix the economy as a Universe, within which a defined concept (class) is thought out, and the credit system as a class — a concept defined by us.

As a supplement (to the class), we highlight non-credit systems of the economy, such as the financial, monetary, tax, and budgetary systems (Fig. 1).

In the next step of applying the method, it is necessary to establish the necessary and at the same time sufficient conditions for its unambiguous definition.

First, as a component of the universe, the credit system is to include some fundamental characteristics of the economic structure.

Any system has specific resources. The economic system is no exception. If we start

from this position, being a subsystem of the economy means possessing specific resources. In addition, this is a necessary condition for defining the credit system. However, at the same time, it is not sufficient for its unambiguous definition.

We propose that the feature of the credit system (and, at the same time, a sufficient condition for its unambiguous definition) lies in the properties of its resources.

Our research has shown the following. The resources of the credit system possess such properties as return ability, term-limitedness, and cost. The resources of the monetary and financial systems have different properties. The resources of the monetary system are perpetual. The resources of the financial system can be free and non-repayable. The resources of the tax system are free, indefinite, and non-refundable.

Thus, the properties of resources can serve as a sufficient condition for clearly distinguishing the credit system from a number of similar, but not identical, objects.

Therefore, we have the following definition: the credit system is a subsystem of the economy that possesses specific resources characterized by the properties of return ability, urgency, and cost.

Despite the fact that this definition seems obvious, we have not found it in such a formulation in either scientific publications or educational literature. Moreover, it is obtained

through the scientific method, which ensures its validity. The method allowed us to identify a truly significant characteristic of the studied object — the credit system.

In the second stage of developing a definition of the concept of the credit system, a categorical method of one-level triadic decoding of the basic concept was applied. This allowed us to construct a one-level model of triadic decryption of the credit system (see *Fig. 2*), reflecting its nature through basic functions.

The method is implemented in the following sequence. Firstly, a triad of first-level decoding concepts has been identified: “Accumulation of credit resources”, “Redistribution of credit resources”, and “Multiplication of credit resources”. This triad reflects the fundamental functions of the credit system. In this model, they are arranged in a specific sequence that reflects the pattern of their emergence in the credit system throughout its evolution.

The choice of these categories is explained as follows.

#### **[0] Accumulation of credit resources**

The limitation (both quantitative and qualitative) of credit resources has created the need for the formation of a special type of system capable of compensating for it by means of accumulation. It is no coincidence that many researchers of the credit system often point to its ability to accumulate temporarily free resources, predominantly belonging to the population and economic entities, both monetary and non-monetary [3, 29, 30].

This function is specific to the credit system, as it accumulates credit resources that are characterized by return ability, term, and cost, unlike the resources accumulated by other subsystems of the economy.

#### **[1] Redistribution of credit resources**

After the credit resources are accumulated, they are primarily used for lending purposes. That is, they begin to be redistributed taking into account their urgency, cost, and

returnability among the entities of the economy in the interests of the functioning of the economic system as a whole. The ability of the credit system to redistribute credit resources is also noted by researchers [31, 32]. For example, the renowned researcher of the credit system A. I. Polishchuk asserts that the fact of accumulation and redistribution of resources in the credit system is an axiom that requires no proof [12].

#### **[2] Multiplication of credit resources**

Furthermore, when the credit system gained the ability to accumulate credit resources and redistribute them, the possibility of their multiplication arose. This need exists in the economic system, as it allows it to develop in an expanded mode. This property, on the other hand, allowed the credit system to offset the limitations of credit resources. The ability of the credit system to multiply credit resources is described by researchers as the action of the reserve, deposit, and credit multiplier [33–35]. The credit system is unable to increase credit resources several times without accumulation and redistribution, as accumulation ensures the attraction of temporarily free resources from various sources within the economic environment, while redistribution involves the constant movement of resources in the interests of stakeholders through transfer, conveyance, or assignment. Together, they form the foundation for multiplication, allowing the credit system to achieve its basic goals: the preservation, saving, and accumulation of credit resources in the interests of the economic system.

We have received a definition, supplemented with functions: the credit system is a subsystem of the economy, possessing specific resources characterized by the properties of returnability, urgency, and cost, and performing the functions of accumulation, redistribution, and multiplication.

Thus, the categories of “Accumulation of credit resources”, “Redistribution of credit



resources”, and “Multiplication of credit resources” reflect the fundamental functions of the credit system, ensuring its existence and development in the interests of the economic system as a whole.

It should be noted that other subsystems of the economy, with which the credit system constantly and closely interacts, are similar but not identical to it.

The tax system, like the credit system, redistributes resources by setting and changing the rules. However, it is not capable of multiplying resources; its primary purpose is to fill the state budget with resources. In the tax system, one can also identify other specific qualities inherent to it, for example — the function of regulation. However, for the credit system, it is not fundamental.

In the financial system, one can observe qualities similar to those of the credit system; however, the tasks of accumulation and the rules of redistribution in this system are different. The purpose of accumulating resources in the financial system is to provide them for special targeted funds. Nevertheless, it is not capable of multiplying deposits. At the same time, the financial system is capable of reallocating resources, but under conditions different from those of the credit system.

In turn, the banking system is primarily an intermediary, and only secondarily a creditor, agent, operator, regulator, issuer, and guarantor. That is, in theory and in practice, banks perform not only the functions of the credit system but also the functions of the monetary, financial, payment, and possibly other subsystems of the economy.

Thus, the categories we have identified reflect the fundamental functions of the credit system and are unique to it in this composition.

In the next step, it is necessary to highlight the second-level categories that decode the categories identified in the previous step.

#### **[0] Accumulation of credit resources**

The category “Accumulation of credit resources” can be deciphered into the

categories [00] “Preserving”, [01] “Saving”, [02] “Accumulating”, reflecting the varieties of this function of the credit system.

*Preserving* the accumulation of credit resources allows the credit system to not only organize the formation of credit resource funds but also to expand the boundaries of its presence, establish connections with other economic systems, and meet their current needs in settlements. To deposit accumulated credit resources, credit organizations open settlement, current, and other liability accounts for economic entities. Temporarily free funds, predominantly belonging to the population and economic entities, settle in accounts, both monetary and non-monetary resources. Accumulated resources for lending, credit organizations are obliged not only to preserve them but also to carry out actions for their transfer and remittance at any time upon the account holder’s request. At the same time, the yield on such accounts is minimal.

*Saving* the accumulation of credit resources ensures the retention of resources from the population and economic entities by the credit system to meet future needs, creating additional opportunities for their accumulation. Credit organizations open savings and deposit accounts for the preservation of monetary and non-monetary resources, offering economic entities attractive conditions that include protection against devaluation. Credit organizations can set different conditions by changing the rate, term, and order of income payment. A deposit account is opened for a limited term, while a savings account is opened without a time limit. In the process of saving and accumulating credit resources, the owner of a savings account, unlike a deposit account, is given the opportunity to deposit and withdraw funds from the account. Since economic agents can withdraw their savings at any moment, credit organizations cannot fully utilize them for long-term lending purposes. Therefore, the yield on savings accounts is low.

*Accumulating* of credit resources ensures the creation of a safety cushion for the credit system, which is essential not only for its formation and development but for the development of the economy as a whole. For cumulative accounts opened in credit institutions, the owner is offered more attractive conditions that allow for increased profitability. Therefore, for savings accounts, in most cases, interest is accrued monthly or daily with capitalization. On deposit accounts, there is a higher fixed interest rate if resources are deposited for a long term. However, the accumulating accumulation in the emerging credit system becomes possible in a favorable environment for it, where credit, stimulated by the environment, develops. At the same time, the share of long-term resources in the structure of accumulated credit resources will gradually increase.

Thus, the highlighted triad of categories with the most necessary and sufficient degree of completeness characterizes a fundamental function of the credit system, namely “accumulation of credit resources”, which is realized in forms such as preserving, saving, and accumulating, and serves as a necessary condition for the emergence and natural evolution of the credit system.

It should be noted that certain forms of accumulation are also implemented in other subsystems of the economy. However, in them, these functions are implemented in relation to resources that are specific to these subsystems, whereas in the credit system, they are implemented in relation to credit resources. Thus, in the financial system, there is an implementation of accumulating the accumulation of financial resources. Funds are formed (for example, the charter fund, reserve fund, bond fund) from financial resources and are used to finance planned objectives.

#### **[1] Redistribution of credit resources**

The category “Redistribution of credit resources” can be deciphered into the categories [10] “Transferring”, [11] “Conveying”, and [12] “Assigning”, which

reflect the varieties of this function within the credit system.

*Transferring* redistribution of credit resources. This ability of the credit system is manifested in the servicing of accounts for economic entities and the population by credit organizations. Credit organizations are obliged, at the request of the account holder, to transfer funds within the available balance, completing the settlement process. For example, transferring funds to pay for purchased goods, services rendered, or for salary payments and tax payments, or simply for depositing into another account elsewhere. In this regard, credit organizations use correspondent accounts opened at the central bank or at another credit institution to carry out transfers. Credit organizations list (transfer) accumulated credit resources through correspondent accounts for subsequent crediting to the accounts of recipients of funds located elsewhere within the existing active balance.

This function of the credit system, on one hand, establishes connections within the system and links with other subsystems of the economy; on the other hand, changes in the speed of transfers complement accumulation with new saving opportunities.

*Conveying* redistribution of credit resources by the credit system is manifested in the process of transferring accumulated credit resources to an economic entity with the confidence of repayment. By setting limits, interest rates, and terms for loans, credit organizations ensure the transfer and redistribution of credit resources within the credit system. So, accumulated credit resources in one place are provided in another. For example, credit organizations in one country accumulate credit resources within the country and place them under more attractive conditions outside its borders. Either the temporarily free resources accumulated in one sector of the economy are placed by credit organizations in another, as the benefit from allocating credit resources in a different sector is greater.

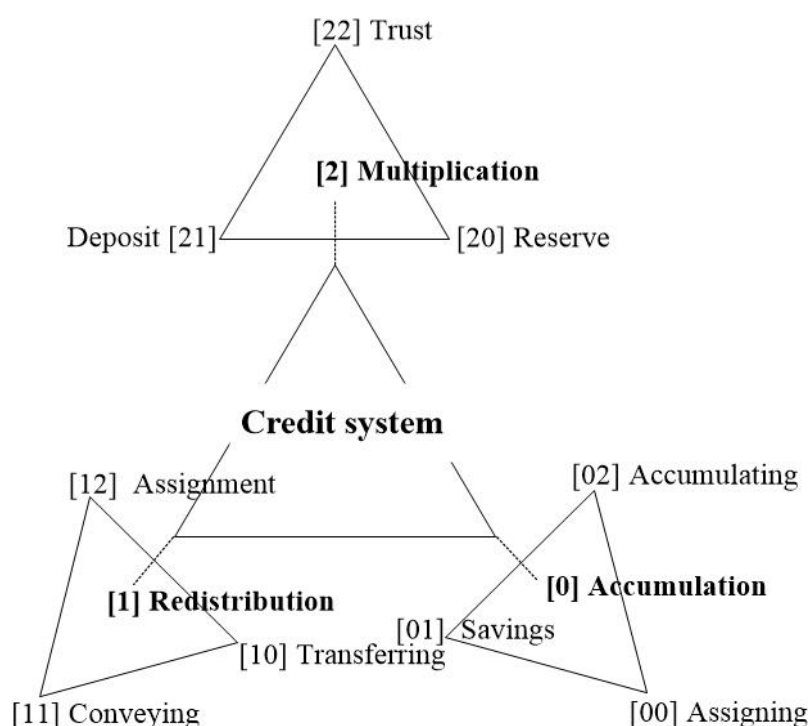


Fig. 3. Model of Two-Level Triadic Decoding of the Category “Credit System”

Source: Compiled by the author.

This function of the credit system, firstly, strengthens connections with other subsystems of the economy; secondly, it expands the possibilities for saving and accumulating; and thirdly, it lays the foundation for the multiplication of credit resources.

*Assigning* redistribution of credit resources in the credit system is responsible for their movement between participants in the credit process and reflects the cooperation and partnership of credit organizations. Assigning redistribution is carried out by the credit system when accumulated credit resources are transferred to credit organizations with the assurance of repayment, or when already transferred (sold) credit resources are assigned to a third party. Credit resources are redistributed through their assignment (resale) from one credit organization to another. In the event that a credit organization temporarily lacks funds in its correspondent account to fulfill its obligations, credit resources may be provided to it by the Central Bank or another credit organization.

The assignment in one credit organization is reflected in the correspondent account as accumulated credit resources, while in another, it is reflected as transferred (sold) credit resources. This function is responsible for adapting the credit system to external challenges.

Thus, the highlighted triad of categories with the most necessary and sufficient degree of completeness characterizes a fundamental function of the credit system, namely “redistribution of credit resources”, which is implemented in forms such as transferable, assignable, and ceded, and allows for an understanding of the objective reality (nature) of its existence.

We note that the redistribution function is also implemented in other subsystems of the economy, but in those, this function is secondary. Only in the credit system is it fundamental. Financial resources in the financial system are formed during the distribution of primary incomes of economic entities and are allocated in favor of other economic entities, and only when necessary

are they redistributed to balance incomes and expenses.

## **[2] Multiplication of credit resources**

The category “Multiplication of credit resources” can be deciphered into the categories [20] “Reserve”, [21] “Deposit”, and [22] “Trust”, which reflect the varieties of this function of the credit system.

The *reserve* multiplication of credit resources is responsible in the credit system for creating reserves for conducting payment and settlement operations. By reserves, we mean the funds of credit organizations in accounts at the Central Bank. Reserves are formed from one’s own considerations of caution and/or the directives of the Central Bank. In the process of lending through the transfer or assignment of credit resources, the shortage of reserves of one credit organization is compensated by the surplus reserves of another credit organization, or by the reserves created by the Central Bank. The key to the effective functioning and development of the credit system is the continuous increase of credit resources, including those generated by created reserves.

The *deposit* multiplication of credit resources reveals the ability of the credit system to multiply deposits multiple times in the process of lending to economic entities. Modern credit institutions are empowered to create deposits (credit obligations). When a credit institution issues a loan, it accounts for it as an asset, while the deposit created in the process is considered a liability. Credit organizations, by lending to borrowers, create deposits (initially belonging to the borrowers). These deposits can then be used as a means of payment and, consequently, distributed among clients of other credit institutions. At the same time, the lending process can be carried out multiple times. This function in the credit system is responsible for the advantageous attraction and placement of deposits and loans.

*Trust* multiplication of credit resources. In some cases, the multiplication is carried

out by the credit system without the transfer of reserves and deposits. Credit organizations, having credit resources, create (issue) other credit obligations based on them — for example, a promissory note. In the process of providing a trust-based loan, the credit obligation is created by the lender (a promissory note) or the borrower (a simple note). The emergence of a promissory note does not mean that a credit organization instantly acquires credit resources; however, it does provide a justification for the future inflow of credit resources. A necessary condition for the development of any credit system is trust in credit organizations that ensure the continuous growth of credit resources, including through the creation of promissory notes.

Let us note that the functions of resource multiplication are also implemented in other subsystems of the economy. However, in them, these functions are not fundamental. Only in the credit system do they (the functions of reserve, deposit, and trust multiplication of credit resources) serve as such. In other subsystems of the economy, different forms of resource multiplication are implemented. For example, in the monetary system, the function of credit multiplication of monetary resources is implemented (cashless issuance of banknotes), while in the financial system, the function of trust-based multiplication of financial resources is realized (issuance of treasury bills, bonds).

Thus, the highlighted triad of categories with the most necessary and sufficient degree of completeness characterizes such a fundamental function of the credit system as the “multiplication of credit resources”, which is realized in forms such as reserve, deposit, and trust. On one hand, this reflects the activities of the credit system in the interests of the economic system, and on the other hand, it serves as a necessary condition for its progressive development.

It should be noted that researchers of credit systems observe the mentioned



processes of multiplication; however, unfortunately, these properties (functions) are not reflected in the definitions of the concept of a credit system.

The results of applying the two-level decryption operation in the “credit system” category are presented in *Fig. 3*.

Thus, the application of the categorical method of two-level triadic decoding of the basic category has allowed us to identify the fundamental functions that the credit system performs within the economic system. These functions are specific to this system. In addition, specific to it is their composition. No other subsystem of the economy possesses this specific set of functions performed. This is precisely what allows us to clearly distinguish the credit system from other subsystems of the economy.

Twelve categories reflect the natural, essential aspects of the credit system, the functions that contributed to its formation, and now ensure its functioning and development.

The concepts we have developed using methods of formal-logical definition and two-level triadic decoding of the basic category of the credit system model reflect its fundamental qualities, allowing us to construct a scientifically grounded definition of the corresponding concept: “the credit system is a subsystem of the economy that possesses specific resources characterized by the properties of returnability, urgency, and cost, and performs the functions of accumulation (preserving, saving, accumulating), redistribution (transferring, conveying, assigning), and multiplication (reserve, deposit, trust)”. The interconnection of the fundamental functions of the credit system is realized as follows:

- 1) credit resources are accumulated within the credit system;
- 2) then they are redistributed by the credit system;
- 3) and in the process, they are multiplied in the interests of the stakeholders.

Let us note once again that similar functions can be observed in other subsystems of the economy. This is explained by their close interconnections and interactions with each other. However, the implementation of specific functions inherent to the credit system in other subsystems of the economy differs significantly. This makes it necessary and possible to distinguish the credit system as a separate subsystem of the economy.

Thus, the developed model and definition of the credit system have allowed for the reflection of the most significant, fundamental qualities in the object of study, which ensures its systemic understanding. The order of the categories arranged in the model (*Fig. 2*) reflect the pattern of the emergence of fundamental functions of the credit system in the process of its evolution from simple to complex. Unlike the existing axiomatic model of the object by A.I. Polishchuk [12], which is used to define the concept of a credit system, the model we have developed represents an ordered system of categories that reflects the credit system as a distinct phenomenon with the necessary and sufficient degree of completeness.

Unlike the definitions found in contemporary scientific literature [1, 4, 11, etc.], the one developed in this article reflects the natural essence of the credit system and its specific distinctions from other types of economic systems.

The scientific results obtained in this study align with the proposed hypothesis and the planned objective.

## CONCLUSION

In the context of this study, the subsequent scientific results has been acquired.

- 1) A model of the credit system has been developed, reflecting a larger system (the economy), of which it is a subsystem. The necessary and sufficient condition for classifying objects as credit systems is, accordingly, to possess specific resources that



have the characteristics of returnability, term, and cost.

2) Based on the proposed model, a definition of the concept of “credit system” has been developed: “a subsystem of the economy that possesses specific resources characterized by the properties of returnability, timeliness, and cost”.

3) A comprehensive model of the credit system has been developed, reflecting its fundamental functions (accumulation, redistribution, multiplication of credit resources) and their varieties.

4) Based on the proposed models, an extensive definition of the concept of “credit system” has been developed: “a credit system is a subsystem of the economy that possesses specific resources characterized by the properties of returnability, timeliness, and cost, and performs the functions of accumulation (preserving, saving, accumulating), redistribution (transferring,

assigning), and multiplication (reserving, depositing, trusting)”.

The developed models contribute to the advancement of the scientific theory of credit and the credit system. They also allow for the introduction of a logically correct definition in the subject area that reflects the nature and essence of the credit system.

The involvement of the categorical method and the method of formal logic contributes to the development of the research methodology in the field of the credit system.

The practical value of the scientific results obtained lies in their contribution to clarifying the understanding of the nature of the credit system and, thus, in forming a more adequate theoretical platform for developing a program for the advancement of the domestic credit system. In turn, such a program, having a reliable theoretical foundation, will be more effective both at the macro level and at the level of credit institutions.

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