

## INSTITUTION CONCEPT OF FINANCE OF INFORMATION SOCIETY

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**Annotation.** *This work attempts to formulate a coherent institution conception of finance for the information society. The essence, features and objective intended purpose of finance (financial infrastructure) of the information economy, stages of its institutionalization are studied. On the basis of the fractality principle, the architecture of the institution of finance and its subsystems are reviewed. The basic principal institution matrix of finance (financial infrastructure) of the information economy is built.*

**Keywords:** *finance, institution of finance, financial infrastructure of the economy, financial accounting, finance information subsystem, institution of financial accounting, principle of fractality in building of the institution of finance, macroeconomics finance, microeconomics finance, institution matrix of finance.*

**Target Setting and Its Relevance** With development of the information society, interest objectively grows in the aspect of institutionalization of finance, which seem to be already well-known and familiar. There are the following reasons for this: formation of new, characteristic for the informational economy of subsystems of finance; complication of financial relations; increasing information asymmetry in them; depth and breadth of financial crises; fundamentally new understanding of the phenomenon of information and the role of information as an influential economic resource, and factor in creation of added value.

It becomes obvious that finance plays a unique infrastructure role in the economy and it is directly related to information, information exchange of the society. The traditional approach, representing finance simply as a system of monetary relations, does not allow nowadays to meet needs of the economic development, to explain completely, and to reliably predict processes, observed in the financial and economic life of the society. In our opinion, the theory of institutionalization provides an opportunity to understand better and explain processes, taking place today in the economy and its finance, and assess prospects of their development.

The notion of “social institution” refers to the abstract vocabulary and is a scientific term. At the same time, it represents real ties, existing in the society, and relations, which are organized in relatively stable forms (structures). Although social institutions do not have a real embodiment in certain physical objects, their occurrence and existence are possible only due to such a reality. Moreover, the scientific understanding of the essence, characteristics and the purpose of social institutions can knowingly influence development of these institutions.

The theory of institutionalization allows the following: to reveal the essence of

finance in a new way; understand them as the financial infrastructure of the economy, in which processes of value and information interactions constantly occur; to identify features of this infrastructure; to study its place and the role in the general architecture of institutions of the information society.

Investigating the topic of institutionalization of the information society finance, the article considers:

- (i) the essence of concepts of “institution” and “institutionalization”;
- (ii) the essence of finance (financial infrastructure) of the information economy, their characteristics and the public purpose;
- (iii) peculiarities of the information society as being an environment for formation (a) of the financial infrastructure of the information economy and its (b) information subsystem – financial accounting;
- (iv) stages of institutionalization and peculiarities of the modern stage of development of finance (financial infrastructure) of the economy;
- (v) features of functioning of the financial infrastructure as an integral system, its place and role in the general institution of the economy of the society.

**Overview of existing research topics.** The founder of the institution direction in the economic science is American economist Thorstein Bunde Veblen, who in his work “The Theory of the Leisure Class. An Economic Study of Institutions” (1899) [1] for the first time in the economic theory analysed the concept of the institution. He defined social institutions as stable habits of thinking that are characteristic of a large community of people.

More than a hundred years later, at the beginning of the XXI century, materials from the Encyclopedia of Philosophy, prepared by one of the most authoritative and world-class universities – Stanford University (USA) – it was determined that *social institution is a form of organization of joint activity of people, which is formed historically, and (or) as a result of purposeful human efforts, and existence of which is conditioned by the need to meet social, economic, political, cultural or other needs of the society as a whole or partially* [2].

In the Ukrainian economic science, the subject of institutionalism was thoroughly investigated by Anatolii Chukhno, Doctor of Economics. He wrote that institutionalism, being a complex formation both in areas of research and in advances in the knowledge of economics and the society, nevertheless, was one of the common areas of the modern economic theory. In this case, the term “institution” is used to refer to complex social forms that can be reproduced in generations, and the significance of the interpretation of institutions is manifested, in particular, in the fact that they form one of the main directions of the modern economic theory [3, P. 204-224].

A. Chukhno characterized institutions as a peculiarity of the economy, especially complex social forms or structures that are inextricably linked with the system of production and social relations. According to his definition *institutions are relatively stable patterns of systemic human activity, address the fundamental issues of production, resource provision, human reproduction, the sustainability of social structures.*

The scientist wrote that institutions collectively formed the institution structure of the economy, which was characterized by a certain autonomy, and which was adequate to the structure of the economy and the society, reflected the system of production and social relations, and were their implementation. He emphasized that the combination of production relations and institutions enriched and specified the idea of a social structure, expanded the possibility of overcoming simplistic approaches to the interpretation of complex social and economic problems, and explaining depth and complexity of relations and dependencies, which, in turn, allowed us to identify mechanisms for implementing the system of production relations, functioning and development of the economy and the society. One of his conclusions was that focusing only on market aspects of reforms and underestimating institution transformations lead to a number of negative phenomena and processes. Therefore, consistent implementation of market transformations required a combination of social and economic, and institution transformations.

Another prominent Ukrainian scientist – Yurii Pakhomov, describing the concept of “social institutions”, wrote that it was multicomponent and capacious one. And “although the institution and infrastructural infrastructure of the market and the state existed always, not only providing, but also optimizing interaction of the market and the state, nowadays, especially due to the factor of technological dynamism and the global uncertainty, the quality, adequacy and systematic formation of institutions were crucial factors of successful development of a country. In this case, the need for such greater, the more democratic the society was” [4].

When studying the concept of institutionalism, the modern science means processes of development of social institutions and their interconnection systems, development of the institution structure (architecture of institutions of the society) and corresponding institutions. It is believed that a social order is formed in the course of institutionalization, that is, the way, in which forms are manifested in social relations, as interrelated social systems and their elements, which structures, processes and changes inherent in the society, how they are reflected in behaviour and interaction of individuals, as well as functioning of the social system as a whole. And this is why analysis of the origin of social order, forms of its maintenance and reproduction should be based on the concept of institutionalization [5].

In the financial science of Ukraine, the subject of institutionalization of finance was first substantively investigated by representatives of the financial science school of Kyiv National Economic University named after Vadym Hetman in works, devoted to the financial infrastructure of a market economy. The first among these works were articles by Professors Viktor Fedosov, Valerii Oparin and Serhii Liovochkin: “Institution Financial Infrastructure of Ukraine: Current State and Development Problems” (2008) [6] and “Financial Infrastructure of the Market Economy: Conceptual approaches” (2008) [7]. They, from the standpoint of institutionalism, defined the financial infrastructure of the economy for the first time as an independent phenomenon. They proposed two closely interrelated dimensions of approaches to the characteristics of the financial infrastructure of the economy. The first dimension is from the perspective of understanding of finance

as one of the important components of the economic infrastructure, which stems from the essence and objective functions of finance. The second is from the standpoint of formation of a set of different elements (components), ensuring functioning of finance as a social institution by different sections: institution, managerial and instrumental.

The institution of financial infrastructure of the economy is a system, in which the value section (aspect, plan, dimension) of social relations is realized. Representing in the society value relations, it is an economic category. In essence, this is a well-known in modern science and practice category of finance, but in this case it is viewed from the perspective of institutionalism. The study of finance from the point of view of institutionalism – as the financial infrastructure of the economy – opens new facets in this economic category and promotes an adequate conscious development of finance of the information economy.

V. Fedosov, V. Oparin and S. Liovochkin stated that *finance played a provision role for the economy, and were a separate important component of the economic infrastructure*. At the same time it was stressed that the financial infrastructure of the economy was extremely complex, multi-layered and the integral phenomenon simultaneously. *Its main purpose, first of all, was to create, in conjunction with other components of the economic infrastructure, the appropriate prerequisites for the reproduction process, which was the basis of the society's life*. Noting that the complexity, diversity and dynamism of development of the financial infrastructure of the economy necessitated additional deep and comprehensive researches, scientists showed that the given infrastructure of the economy could be considered in two sections: organizational and instrumental one. Each of them had information products and services.

**Research Results.** Based on the above, one can note the following:

*first of all, the notion of “finance” and “financial infrastructure of the economy” are identical;*

*the institution of finance (financial infrastructure of the economy) is relatively stable, formed adequately to the information society and structure of its information economy, form of organization of the system of value relations, the existence of which is conditioned by needs of the society.*

Finance (financial infrastructure of the economy) is a system – an institution structure that has a certain autonomy; this system is constantly evolving under the influence and is adequately to the characteristics of the economy and the society, in which it operates.

The institution of financial infrastructure of the economy is a historical category, development of which has a number of objective peculiarities (characteristic features):

*First, the process of evolution of the financial infrastructure of the economy is permanent.* That is, despite development of financial relations of the modern society, the process of their development continues. In the information economy and the society, finance objectively develops in unison of the progress of information technology and growth of the role of information as an economic resource.

*Second, institutionalization of the financial infrastructure of the economy, being complex and multidimensional one, is a trans-sectoral (transdisciplinary) process.*

In the information society, this process involves not only a purely value aspect of the economy, but also informational one. After all, information is a filling of all the financial relations, and is always present in financial flows; peculiarities of financial information as a unique phenomenon are reflected in the process of institutionalization of the financial infrastructure of the economy and its information subsystem; laws of information exchange affect financial relations.

*Third, developing as a single integral system, the financial infrastructure of the economy has subsystems (components) that differ by level (stage) of development, and do not coincide with the level of development of the general system of the financial infrastructure.* This is due to the fact that, when evolving adequately to development of the economy and the society, first of all, those subsystems rapidly develop in the financial infrastructure, which ensure this adequacy. For example, in the economy of the information society, the information subsystem responsible for such an adequacy is represented by the institution of open information – financial accounting.

The institution of financial accounting is a systematic activity in gathering, analysing, preparing and presenting information to users about the financial infrastructure of the economy that is necessary for them and is not restricted by access (that is, not confidential, non-secret and non-official) information. The result of the institution of financial accounting is the relevant information products and services. In detail, the institution of financial accounting is explored, in particular, in the following works of the author of this article and colleagues: “Financial Accounting as an Information and Infrastructure Subsystem of the Modern Macroeconomics” (2017) [8], “Financial Accounting as an Information Infrastructure Subsystem of the Modern Microeconomics” (2016) [9], “Financial Accounting as an Institution and Infrastructure Component of the Information Economy” (2016) [10], “A New Look at the Financial Accounting of the Information Society” (2015) [11].

*In the informational economy, the objective public purpose of its finance (financial infrastructure) is to ensure the process of movement and distribution of value (money capital) in accordance with needs of participants of the economy. This is possible only, if there is a proper information exchange in financial relations.*

Institutionalization<sup>1</sup> is a dynamic and multidimensional process that encompasses emergence, organization and formalization of activities, links and relationships, necessary to the society, in the relevant social (public) institutions. Institutionalization of finance (financial infrastructure of the economy) takes place in direct relation with the general social and economic development of the society and under the influence of its historical peculiarities.

Almost two centuries ago, Karl Marx wrote that economic epochs differed not in what was produced, but in how was produced, by which means of labour [12, P. 191]. The peculiarity of the modern stage of development of the society is emergence of a fundamentally new economic resource, factor of production – information that

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<sup>1</sup> Institutionalization – from the Latin *instituitum* – that is, establishment, custom, foundation.

essentially characterizes the information economy and the society, defines development of its institutions, in particular, of the financial infrastructure of the economy.

At the beginning of the XXI century A. Chukhno, studying the methodology of modern institutionalism, noted that it was based on the objective process of growth of the scientific and technological factor in development of the economy and the society, and it was technical and technological changes that determined changes and development of institutions, the place and the role of a human being in production and the society. At the same time, it was modern institutionalism that revealed the dynamics of the social and economic progress, the consistent movement of its regular stages: pre-industrial, industrial and informational (post-industrial) society [3, P. 211-215]. Considering stages of social and economic development, the scientist stressed that the category of “production” was so important that it determined not only the mode of production, but also name of the society. When along with such factors of production as land and labour, the capital came to be decisive one, then the society was called capitalist. Currently, information and knowledge are an essential characteristic of a new society and its economy, so they are called information or knowledgeable (*studying institutionalism, the scientist identified the notion of information” and “knowledge” - H.P.)* [3, P. 211-217].

“Civilization is information” – such an algorithm was brought up by Dennis Holme Robertson, Professor of Economics at Cambridge University, at the end of the XX century, which considered information to be decisive in economics, technology, art, philosophy and other areas of human activity [13]. The modern science unequivocally recognizes that exchange of information lies at the heart of development of the economy and the society as a whole, covering processes of collecting, recording, storing, processing, transferring and using various data. And, depending on types and volumes of information, processed by the society, the modern science distinguishes five levels (stages) of human civilization<sup>2</sup>. An indicator of the current stage is the electronic processing of information [14, P. 9-10]. The latest information technologies of the past decade have caused the fundamental – related to the information aspect of finance – changes in development of finance (financial infrastructure of the economy).

It should be noted that the society develops unevenly, and at the beginning of the 21st century there is a heterogeneous structure of the world by development. Almost 15% of the world’s population (the “golden billion”) lives in developed countries, where formation of information technology production and the information society takes place. The second part – about half of the population – lives in industrial way of production and in the industrial society. The rest of the population (almost one third) lives in countries and backward regions of individual countries that are in the pre-industrial stage of social and economic development [3, P. 211-217].

2 Level “0” – information capacity of the human brain –  $10^7$  bits; level “1” – oral communication in a community or tribe –  $10^9$  bits; level “2” – a written culture, the size of which is the Library of Alexandria, containing 532,800 scrolls –  $10^{11}$  bits; level “3” – a book culture, characterized by the existence of hundreds of libraries and tens of thousands of printed publications –  $10^{17}$  bits; level “4” – electronic processing of information –  $10^{25}$  bits.



The authorship of the term “information society” belongs to Professor of Tokyo Institute of Technology Yu. Hayashi (Japan)<sup>3</sup>. But the global distribution of this concept came after the report “Technology for America’s Economic Growth, a New Way to Build Economic Power”, made by the United States leadership in 1993 at one of the conferences [15]. A little bit later, one of the leading specialists in the field of the information society theory – American sociologist Manuel Castells, in work “The Information Age: Economy, Society and Culture” (1996-1998) stated that the information age marked emergence of a new society, which was formed by deployment of the network of information and communication technologies, and the priority was the flow of information [16; 17, P. 130-164].

In 2000 in Okinawa (Japan) at a meeting of representatives of different states, the “Charter of the Global Information Society” was adopted [18], which fixed the basic principles of the entry of countries into the information society. A little bit later, under the auspices of the United Nations in Geneva, the World Summit on the Information Society took place, the main result of which was adoption of the Declaration of Principles for Building of an Information Society [19]. In this document, building of an information society was recognized as a global task for the new millennium. At the same time, in science and practice, the civilization approach in knowledge of the society gradually established itself, which, unlike the class one, characteristic of the past decades of the approach, followed from universal human values [3, P. 211-215].

The modern science highlights a number of characteristic features of the information society and its economy [16; 17, P. 55-57, 130-164; 20, P. 2-4; 21, P. 20-22; 22; 23; 24, P. 347]. They directly affect finance (financial infrastructure of the economy) and are important for understanding of the process of their institutionalization. Features of the information society are as follows:

(1) Information acquires the status of a special kind of economic resource, production factor, factor of creation of value added, information capital and goods. In finance this is manifested in the relevance of development of their information subsystem.

The status of the driving force of development of the society gradually shifts from production of a material product to creation of information products, and provision of information services, among which information products and services of financial accounting. In addition, there is an increase in the information capacity of material product. For example, production of raw materials, machinery and equipment, as well as construction of buildings and structures at the present stage are accompanied by business plans, numerous technical and financial documents, information exchange, quality, preparation and implementation of which form, among other things, the value of these

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3 On behalf of the Japanese government, Professor Yu. Hayashi in the late 1960s – early 1970s, analysed the impact of computerization on the economy. At the same time, the same processes were studied by Professor of the University of Harvard (USA) sociologist Daniel Bell in work “The Coming of Post-Industrial Society” (1974). Over time, the convergence of these two directions took place, and the notion of “informational” and “post-industrial” society were identified.

goods. The share of the information component in the value of some goods can reach tens of percent.

(2) The possibility of almost instantaneous communication, information exchange and growth of information exchange volumes due to the cross-border information network and the readiness of people to work in it. If from the beginning of the chronology of our era and until 1750 the volume of information exchange was only doubled, then the further doubling took 150 years (1750-1900), and the next after it – 50 years only (1900-1950). In the third millennium, this process became even more rapid, and only during 2006-2010 information exchange multiplied by six times [25]. These data confirm the process of a continuous improvement of information exchange, including with information on finance, and indicate the indisputable existence of its connection with the evolution of the society [26, P. 66].

(3) The globalization of information exchange as a result of rapid development in the society of the information infrastructure. At the same time, the sphere of finance is the leader of this process. Thanks to the latest information technologies, the global information exchange and the globalization of flows of electronic money capital and related financial relations have become reality. That is, the globalization of the economy and finance has become a manifestation of regularities of functioning of information resources in world's economic relations.

At one time, a well-known American scholar on international economic history – Rondo E. Cameron in work “A Concise Economic History of the World. From Paleolithic Times to the Present” (1989), analysing the role of the financial segment of the economy, wrote that development of the society was accompanied by growth of banks and other financial institutions that were necessary to ensure the economic mechanism of the society, which was constantly increasing and complicated [27, P. 383-395]. According to the United Nations Conference on Trade and Development, in the early 2000s, out of the 500 largest TNCs in the world, almost 23% were engaged in provision of financial services (Table 1). At the same time, TNCs, representing the banking business, were 12.4% – the largest number among all the TNCs of the world.

The market category is a kind of informational structure, and in the modern economy, the prevalence of financial markets and their information is obvious. Volumes of transactions in the international capital markets, foreign exchange (FOREX) and futures markets exceed volumes of commodity-purchasing activity in markets of real goods. At the same time, the supranational nature of financial transactions, their intensive development, as well as information exchange that accompanies these processes, have become the main factors of transnationalization of economic activity and development of the globalization processes. Informatization becomes one of the most important aspects of the gigantic process: integration – transnationalization – globalization [29, P.112-115].



Table 1

**Industry distribution of TNCs, providing financial services [28]**

Industry	TNC distribution	
	Quantity	Share
Largest TNCs in the world, total	500	100%
of them financial TNCs, total:	113	22.6%
including by type of activity:		
Banking	62	12.4%
Insurance	37	7.4%
Securities trade	9	1.8%
Other financial services	5	1.0%

Science sets out a number of trends in the process of gaining by financial exchange and financial information of a decisive role in development of the economy of the information society [23; 29, P. 112-115]. *First*, rapid expansion of services of banking, insurance and other financial institutions, as well as advertising. They cover information on all the market segments, taxes, manufacturers and consumers, risks, investment models, and other financial issues. At the same time, the weight of analytical work with information, requirements to its timeliness and quality grows. *Second*, improvement of information technology, in which the financial sector is one of the leaders, which allows it to grow rapidly. This process is an indispensable condition for coordination of the global business structures. Banks, joint investment institutions, stock exchanges and other financial institutions become information centres, accumulate information on the economic status, plans and opportunities of a wide range of economic players.

British Sociologist Frank Webster writes about processes of the globalization of information exchange that the main aspect of the globalization is: (i) the worldwide distribution of information services by banking and insurance corporations; (ii) the globalization of financial markets and continued growth of the integrated global financial market; (iii) the possibility for participants of the economy to receive financial information on a real-time basis for round-the-clock trading in financial instruments; (iv) rapid increase in volumes and rates of the international financial transactions and the simultaneous dependence of any national economy on the global money markets; (v) impressive scales and speeds of information flows. In the economy of the information society, institutionalization of the financial infrastructure of its information subsystem – financial accounting has also a global, transborder nature.

(4) An essential feature of the information society is the increase in the user

requirements for the quality and usefulness of information. This characterizes formation of a genuinely civil society. Development of financial accounting is a direct response to challenges of the civil society and demands of participants in the economy on the need to provide them with open, high-quality and understandable information on the financial infrastructure of the economy.

(5) Finally, feature of the information society and formation of adequate social institutions is the establishment of the proper national and international information law. Legislative consolidation of a system of financial relations is an important feature of the higher stage of institutionalization of such relations. At the same time, the financial infrastructure of the modern economy is already largely enshrined in numerous laws and by-laws of regulations. But, as noted, the process of development of the institution of financial infrastructure of information economy continues, and therefore old normative regulations on finance are revised and new ones are being developed. Adequately to the requirements of the information economy and the information society, the financial policy and financial law change.

Of his day, K. Marx wrote that social institutions were products of historical development [30, P. 4-14]. Being special forms (structures) of manifestation of relations in the society, social institutions develop adequately to the economy and the society, their development depends directly on progress of the society in the relevant technologies and engineering.

Considering the institution of finance of the information economy, it is necessary to focus on peculiarities of its current stage of development.

To date, stages of institutionalization of institutions of the society have already been identified in science. Austrian-American sociologists Peter Ludwig Berger and (Thomas Luckmann) in work “Social Constructing of Reality. The Treatise on the Sociology of Knowledge” (1966), investigating institutionalization as a dynamic process of emergence, establishment and consolidation of social order, considered the notion “institution” in the historical context and distinguished three stages (phases) of development of institutions of the society – typing, objectification and legitimation [31, P. 80-120].

*The first phase of development in the society of this or that institution is typing of activity, which becomes the meaning of such an institution.* At the same time, rudiments of institutionalization exist in every social situation that already functions for some time. Being typified, activity is denoted by the term “institution”. Typing of activity and adoption of the institution by all the members of the society are also interconnected.

*The second phase is formation of the institution.* Here is its objectification, when the institution is historically established due to the ability to reproduce in generations. At this stage, institutions are transformed into an objective social reality, due to their reproducibility in generations and historicity.

*The third phase of institutionalization is consolidation.* It legitimises social order, its explanation and justification. This is observed when the institution order expands beyond the limits of one generation. The need for legalization of the institution appears, because historical reality is inherited by new generations as a tradition. At the third phase,

knowledge about one or another institution and its place in the society is crystallized, an understanding of social reality is established.

In the time dimension, all three phases of institutionalization may follow strictly one after the other, but may coincide in time, i.e., occur simultaneously.

Based on this approach, we can state that *the institution of finance has successfully passed these phases*. We can assert that *taken in the whole modern financial infrastructure of the economy is a developed institution of the society*. Features of its development are as follows: (i) it is fully perceived by the society as an objective social reality, (ii) it is historically fixed and capable of being reproduced in generations; (iii) the society has already accumulated a wealth of knowledge about finance, its place and role in the economy; (iv) financial relationships are enshrined in numerous laws and regulations that explain financial relations and organize them in an appropriate social order.

As a holistic institution of the society, finance develops adequately to the structure of the modern economy, reflecting (realizing) the system of the corresponding relations of the society. *Peculiarity of the current stage of development of the institution of financial infrastructure of the economy is that in its structure, a special role is increasingly played by the information subsystem, in particular, that part of it, which is responsible for open (without restricted access) information – that is, financial accounting*. The level of adequacy of the financial infrastructure for the information economy is determined by the level of institutionalization of this particular information subsystem.

As for institutionalization of financial accounting, the study of preconditions for its development, characteristics and social purpose [in detail, these issues are set out in 8; 9; 10] allows us to conclude that this subsystem of the financial infrastructure of the economy is at the same time at the beginning of the second and third stages of institutionalization. That is, *de facto* financial accounting has existed for a long time, but as a developed information institution of the society, it becomes only in the XXI century. At the second and third stages of institutionalization, formation of the institution of financial accounting occurs, its so-called objectifying, when it becomes an objective reality, historically established and capable of being reproduced in generations. At the same time, in the society, knowledge about the institution of financial accounting, its place and role in the economy are crystallized, legalization, explanation and consolidation as an appropriate social order, and strengthening of the understanding of this institution as a social reality take place. An indispensable component of every stage of institutionalization of financial accounting is research, development and scientific enrichment of the theoretical and methodological basis of formation of this social institution.

In Ukraine, an important proof of institutionalization of financial accounting is the legislative consolidation of information exchange procedures and formation of its conceptual framework. As of the end of 2016, a number of regulations – among them, first of all, Laws “On Information” (1992) [32] and “On Public Information” (2011) [33] fixed a number of definitions of information and access to it. They correspond to the practice of developed economies.

Also, a vivid manifestation of institutionalization of financial accounting in Ukraine

is introduction of the international accounting standards that fully corresponds to trends of the information economy. Over the past twenty years, Ukraine has undergone an extremely important way for its economy and for each individual participant in the economy, of transparency, information disclosure. If at first the concept of drawing up compulsory financial statements by business entities on the basis of the National Accounting Standards prevailed in the country. But they, being closer to the international requirements, nevertheless, did not fully meet them. Currently, the country's financial policy implies a complete transition to the International Financial Reporting Standards. Starting from 2012, the International Financial Reporting Standards (IFRS) are mandatory for joint-stock companies, banks and insurance companies in Ukraine. From 2013 this became indispensable for the rest of the enterprises, providing financial services (except for insurance and non-state pension provision). From 2014, the IFRS should be applied by enterprises that carry out auxiliary activities in areas of financial services and insurance. At the same time, the rest of the business entities have the right to apply the IFRS voluntarily.

In order to implement the policy of standardization of financial statements according to the international principles in Ukraine, special information resources have been created in the web-network. In particular, with the support of the United States Agency for International Development (USAID), within its Financial Sector Development Program in Ukraine (FINREP), an information resource has been created on the website of the Ministry of Finance of Ukraine for assistance in applying the IFRS [34]. It should provide changes and comments in the original language (English) and Ukrainian on standards, information about their use in different countries of the world.

In the concept of institutionalization of finance (financial infrastructure of the economy), the important aspects are the following features: (i) functioning of this infrastructure as an integral structure; (ii) its place and role in the overall architecture of the institution of economy; (iii) interactions of its subsystems with the integral system of finance. These aspects are interrelated and can be explored, using approaches and methods that are well known in other branches of the modern science and are used to study complex systemic structures (entities, institutions).

Modern physics, chemistry, digital technology, applied mathematics, theory of probabilities, and others successfully study complex dynamic structures, using, in particular, the concept of fractal. Fractals<sup>4</sup> are particles of the whole system, which are similar in form and structure to the whole system. Their vivid examples are: in physics and chemistry – crystals, they are crushed into smaller particles, the crystalline structure of which is like a larger crystal; in digital technology – a holographic (three-dimensional) photograph, with

4 In 1975, the notion of “fractal” (translated from Latin *fractus* – crushed, broken, crashed) was introduced into the science by Benoît Mandelbrot – French–American Mathematician, founder of fractal geometry (R. Kronover Fractals and Chaos in Dynamic Systems. The Basics of the Theory. Moscow: Postmarket, 2000, - 352 p., P. 16-21). But objects and phenomena, which are now defined as fractals, were studied long before that. In particular, the idea of a “recursive self-similarity” was suggested by the German philosopher Gottfried Wilhelm Leibniz, 1646-1716).

its granulation, smaller holographic “drawings” appear, containing a full image of the whole hologram, but with fewer pixels<sup>5</sup>, with a smaller digital resolution. Today, it is established that fractals and the general dynamic system are interconnected and interact not chaotically, but according to certain regularities. Each fractal (that is, subsystem, component), whatever part of the general institution structure (or its subsystem) it is not allocated: (i) it contains information (micropicture) about the entire system, and (ii) affects the entire institution structure (system) through numerous diverse relationships.

Economic relations of the society are a dynamic system, that is, a structure that is constantly changing in time and space. With this, *the architecture of institutions, representing economic activity of the society, and the structure of each of them, is built on the fractal principle.*

Based on features of fractals, we can say the following:

*First*, the study of a particular subsystem of an integral institution of finance (in particular, financial accounting) gives an idea both of the whole integral institution of finance, as well as the general institution of economy of the information society.

*Second*, the result of the inadequate functioning and (or) insufficient development of any subsystem of the financial infrastructure of the economy (in particular, underdevelopment of financial accounting) is the decrease in the efficiency of functioning of finance and the economy of the society as integral institution structures.

*Third*, conscious complex, in line with strategic needs of production, development of separate subsystems in the country of the financial infrastructure of the economy (in particular, systemic activities of financial accounting) promotes rapid progress in the economy of the society. Indicators of the latter are, first of all, a radical decrease in the shadowing and corrupt component in the economy as a result of development of the institution of open financial information – financial accounting.

In architecture of the modern economy as an institution of society, it is possible to distinguish two important fundamentally different components: main component and infrastructure.

- *Main subsystem* can include social institutions, representing, for example, such productive activities as: agriculture, industry and construction.
- *Infrastructure* – those institutions that are bricks of the foundation of the institution architecture of the economy, provide its internal structure and integrity, form peculiarities of this or that stage of development of the economy and the society as a whole. This includes, first of all, the institution of finance (financial Infrastructure of the economy), the institution of information infrastructure, as well as institutions that enable the organizational and legal formulation of economic relations.

Separation of two fundamentally different components – main and infrastructural ones – in social institutions, is recognized by the modern national economic and financial science. For example, when studying the global economic space [35, P. 282-283], scientists write that the market and state are pivotal (*in essence – the main ones*,

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<sup>5</sup> Pixel (pixel, pix) – from English picture’s elements, picture cell – that is, an image element.

H.P.) social institutions, and their success is defined as “a kind of institution market and state infrastructure”. The same approach exists in the financial science [6; 7]. Assessing the importance of the information infrastructure in functioning of the overall architecture of the economy, scientists note that at the current stage, “the effectiveness of institutions is evaluated in terms of speed of reporting information on market signals” [36, P.56].

*In the financial infrastructure of the economy of the information society, based on the principle of fractality, it is also possible to distinguish the main and infrastructural components:*

- The main institutions include: the institution of state and local finance, the institution of corporate finance, the institution of household finance, the institution of financial market, and the institution of international finance. Historically, the first institution of finance in the society was the institution of state finance, and today, in all the countries, it remains the most developed one. At the same time, with development of a market economy, the institution of corporate finance and the institution of financial market are rapidly forming. They keep pace with the expansion of the international trade, economic integration and growth of the international money flow. The institution of household finance as a special field of economic monetary relations also gradually crystallizes into a separate significant component of the financial infrastructure of the information economy. At the global, transborder level, all these processes are implemented in development of the institution of international finance.
- As to the infrastructure component of the financial infrastructure of the economy, in the information society, it is represented, first of all, by an information component of the institution of financial accounting and the institution of management accounting.

*Continuing, on the basis of the fractal approach, to deepen consideration of the institution architecture of finance of the information economy, it is also possible to select two subsystems in the institution of financial accounting.*

- Its main subsystem is represented by (i) the institution of financial accounting of macroeconomics, which covers information activities in the field of state and local finance, interstate associations, markets and industries, and (ii) the institution of financial accounting of microeconomics, which covers information activities in the field of household finance and corporations.
- Infrastructure component of financial accounting is represented by the institution of accounting, i.e. activity on collection, accumulation, processing, grouping, generalization and registration (fixation) of information on financial relations of participants of the economy.

Use of the concept of institutionalization in the study of finance of the information society allows to structure all the financial relations of the country and related information subsystems into a single coherent architecture of institutions of the society. Each of these institutions has its place and role in the national economy, interacts with all other institutions and the whole system. Taken together, they form a system that can



be represented as a whole institution matrix<sup>6</sup>. Such a matrix is a system of equations, in which each of the elements represents one or another institution: its financial and related information flows, as well as its place and role in the economy.

We believe that building and research of the institution matrix of finance (financial infrastructure of the economy) is a matter of the near future. At the current stage of the Ukrainian financial science and practice, it is appropriate to draw attention to the need for a systematic qualitative formation of the base of empirical data, on the basis of which, it will be possible to calculate parameters of the system of equations, which will represent this institution matrix. At the same time, it is now possible to formulate conceptual provisions for its building.

We believe that the institution matrix of finance (financial infrastructure) of the national economy should reflect dependencies that can be represented by the following linear equations:

*First*, two equations, one of which represents the institution structure of macroeconomic finance of the country, the other – finance of its microeconomics. Elements of each of these equations should reflect the interaction between the main and infrastructure subsystems of finance. That is, the interaction of (i) cash flow (value movement) within the relevant financial institution (denoted by “**X**”) and (ii) information flows (volumes of information exchange, that is, amount of information), relating to movement of monetary capital of this institution (denoted through “**Z**”) <sup>7</sup>. In this case, the interaction of these two types of institutions (the main financial and infrastructural information) algebraically is embodied in their product, that is “**Z\*X**”.

In addition, the place and role – that is, weight (specific gravity) – should be taken into account – of each of the institutions of finance in the country’s economy as a whole system. That is, specific gravity (a) of its state and local finance; (b) its participation in finance of intergovernmental associations; (c) finance of its markets and sectors; and (d) households, and (e) corporations in the national economy. The magnitude of weight of each financial institution in the national economy is indicated by the corresponding coefficient “**a**”.

Being weighted by the corresponding coefficient “**a**”, the interaction of the main

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6 For the first time, the concept of “institution matrix” was introduced into science by American and Canadian economist of Hungarian origin, Karl Paul Polanyi in work “Life Support of a Human Being”, published in 1977 after his death.

7 The first attempts to quantify information were made by American scientist, electronics engineer, introducing a logarithmic measure of information in 1928. In 1948, American engineer, mathematician Claude Elwood Shannon, in the article “Mathematical Theory of Communication” (1948) proposed the amount of information to be determined, using probabilistic methods. He introduced the concept of information entropy, the main function of which was to reduce or completely eliminate uncertainty. “Bit” was taken for the smallest piece of information, which was the abbreviation of English BInary digiT. In 1946, the concept of bit was suggested to be used for one binary bit, capable of accepting value “0” or “1”, by American scientist, statistician John Wilde Tukey. Bit is believed to be one of the significant concepts of the twentieth century.

financial and infrastructural information institutions algebraically appears to be the product “ $\mathbf{a}_n * \mathbf{Z}_n * \mathbf{X}_n$ ”. This product is a *value-information component, which reflects the place and role of the corresponding value (money) relations and their informational content in the economy*.

Annually (or any other shorter period) cash flows of the institution of state and local finance are denoted by “ $\mathbf{X}_1$ ”, interstate associations – “ $\mathbf{X}_2$ ”, markets and branches – “ $\mathbf{X}_3$ ”, households – “ $\mathbf{X}_4$ ”, and corporations – “ $\mathbf{X}_5$ ”. The corresponding information flows will be denoted as “ $\mathbf{Z}_1$ ”, “ $\mathbf{Z}_2$ ”, “ $\mathbf{Z}_3$ ”, “ $\mathbf{Z}_4$ ” and “ $\mathbf{Z}_5$ ”. And the corresponding coefficients, reflecting weight of each of the components as “ $\mathbf{a}_1$ ”, “ $\mathbf{a}_2$ ”, “ $\mathbf{a}_3$ ”, “ $\mathbf{a}_4$ ” and “ $\mathbf{a}_5$ ”. In sum, these coefficients should be equal to 100%, that is,  $\mathbf{a}_1 + \mathbf{a}_2 + \mathbf{a}_3 + \mathbf{a}_4 + \mathbf{a}_5 = 100\%$ . Coefficients “ $\mathbf{a}_n$ ” reflect proportions (specific gravity) of certain spheres of financial relations in the country’s economy at one or another stage of its development and are determined as follows: empirically, based on long-term, multi-year research; according to expert assessments; benchmarks are examples of the best practices. Taken as a whole finance of the macroeconomic level are designated as ( $\mathbf{Y}_1$ ), and the microeconomic level – ( $\mathbf{Y}_2$ ).

The sum of the interactions of cash flow and information exchange of the macroeconomic level, weighed on their gravity in the economy, is essentially identical to that of macroeconomics. Algebraically this looks like this:

$$\mathbf{a}_1 \mathbf{Z}_1 \mathbf{X}_1 + \mathbf{a}_2 \mathbf{Z}_2 \mathbf{X}_2 + \mathbf{a}_3 \mathbf{Z}_3 \mathbf{X}_3 = \mathbf{Y}_1 \quad (1)$$

Similarly, a linear equation is formed, which represents a set of the interactions of financial institutions of microeconomics and their information subsystems, weighted by corresponding coefficients. This set is identical to the finance of microeconomics and mathematically forms the following linear equation:

$$\mathbf{a}_4 \mathbf{Z}_4 \mathbf{X}_4 + \mathbf{a}_5 \mathbf{Z}_5 \mathbf{X}_5 = \mathbf{Y}_2 \quad (2)$$

Second, equation that shows the relationship between finance of macroeconomics ( $\mathbf{Y}_1$ ) and microeconomics ( $\mathbf{Y}_2$ ). At the same time, coefficients “ $\mathbf{b}_1$ ” and “ $\mathbf{b}_2$ ” show, respectively, the weight of macroeconomics and microeconomics in the general economy of the country and they make up in the sum 100%, i.e.  $\mathbf{b}_1 + \mathbf{b}_2 = 100\%$ . They are determined similarly to the above described coefficients “ $\mathbf{a}_n$ ”, that is: Empirically – based on data for many years; as benchmarks; according to expert assessment. Being weighted by the respective coefficients, the macro and micro-level finance form the integral system of financial relations of the country, represent a value fragment of its economic relations as a single integral institution of the economy, that is equal to “1”. Mathematically this is formalized in the following linear equation:

$$\mathbf{b}_1 \mathbf{Y}_1 + \mathbf{b}_2 \mathbf{Y}_2 = 1 \quad (3)$$

The general picture of the institution of finance (financial infrastructure of the economy) of the information society may be represented by the institution matrix, which is a system of the following three linear equations:

$$\begin{aligned} \mathbf{a}_1 \mathbf{Z}_1 \mathbf{X}_1 + \mathbf{a}_2 \mathbf{Z}_2 \mathbf{X}_2 + \mathbf{a}_3 \mathbf{Z}_3 \mathbf{X}_3 &= \mathbf{Y}_1 \\ \mathbf{a}_4 \mathbf{Z}_4 \mathbf{X}_4 + \mathbf{a}_5 \mathbf{Z}_5 \mathbf{X}_5 &= \mathbf{Y}_2 \\ \mathbf{b}_1 \mathbf{Y}_1 + \mathbf{b}_2 \mathbf{Y}_2 &= 1 \end{aligned} \quad (4)$$

When building this matrix, it should be borne in mind that with the further development of the information society and the spread of information technology in finance: (i) cash flows will increasingly go to non-cash, electronic format; (ii) information exchange on financial relations will also be formalized predominantly in electronic format, and its volume can be digitized, for example, in the corresponding number of bits; (iii) the widespread use of information technology will allow the rapid collection and processing of the necessary information, clarification of data.

Taken in the whole, this system, reflecting in algebraic form the relationship, role and place of elements of the main and infrastructure components of finance, allows you to simulate financial relations of the country. That is, to assess the cash flow within each of the institutions of finance (financial infrastructure of the economy), the weight of each component in the overall structure of financial relations of the country at one or another stage of its economic development, to evaluate the potential weaknesses and challenges, facing participants of the economy, and to find effective solutions for them.

**Conclusions:** In the 21st century it becomes clear that the traditional approach, which represents finance only as a system of monetary relations, satisfies no longer needs of the economic development, does not allow to fully explain and reliably predict processes, observed in the financial and economic life of the information society.

The theory of institutionalization allows us to see the system of economic relations and related activity, including financial ones, as a harmonious architecture of institutions, connections and interdependencies of which are based on the general objective principles. One of them is the principle of fractality. Using it, we can trace the commonality of structures of different institutions of the society: in particular, the institution of the economy, the institution of finance (financial infrastructure of the economy) and the institution of financial accounting, which is typical for finance of the information society.

The institution concept of finance integrates organically with development of the information society and its information economy. Based on it, the institution matrix of finance is logically built. As an instrument for analysing complex processes and phenomena of the financial infrastructure of the information economy, such an institution matrix can be used to evaluate and forecast development of finance of the national economy, its macroeconomic and microeconomic segments.

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